Composite straight steel double girder pedestrian bridge

TABLE OF CONTENT

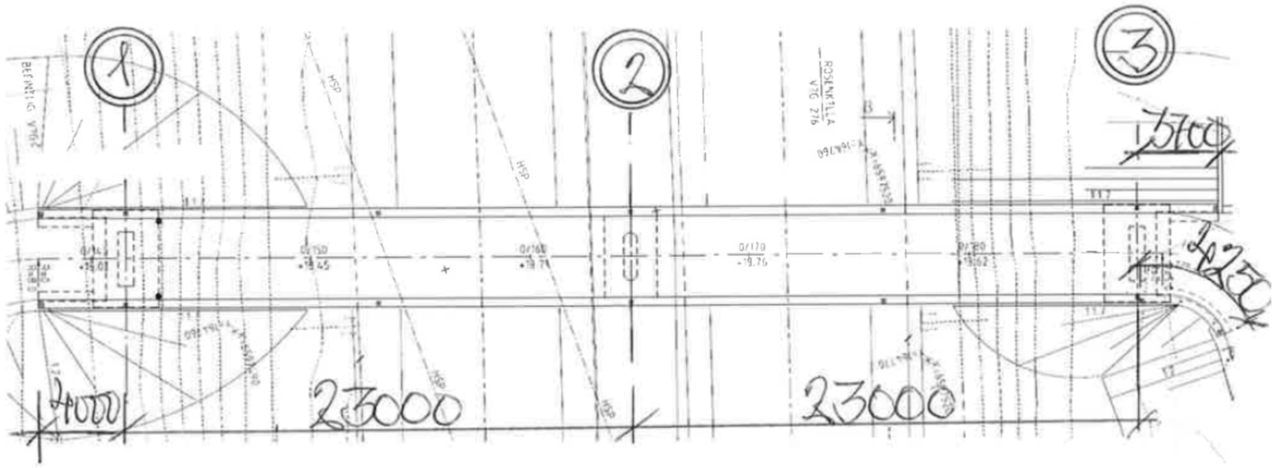
1. ALLMÄNT / MÅTT

1.1 KONSTBYGGNADSTYP

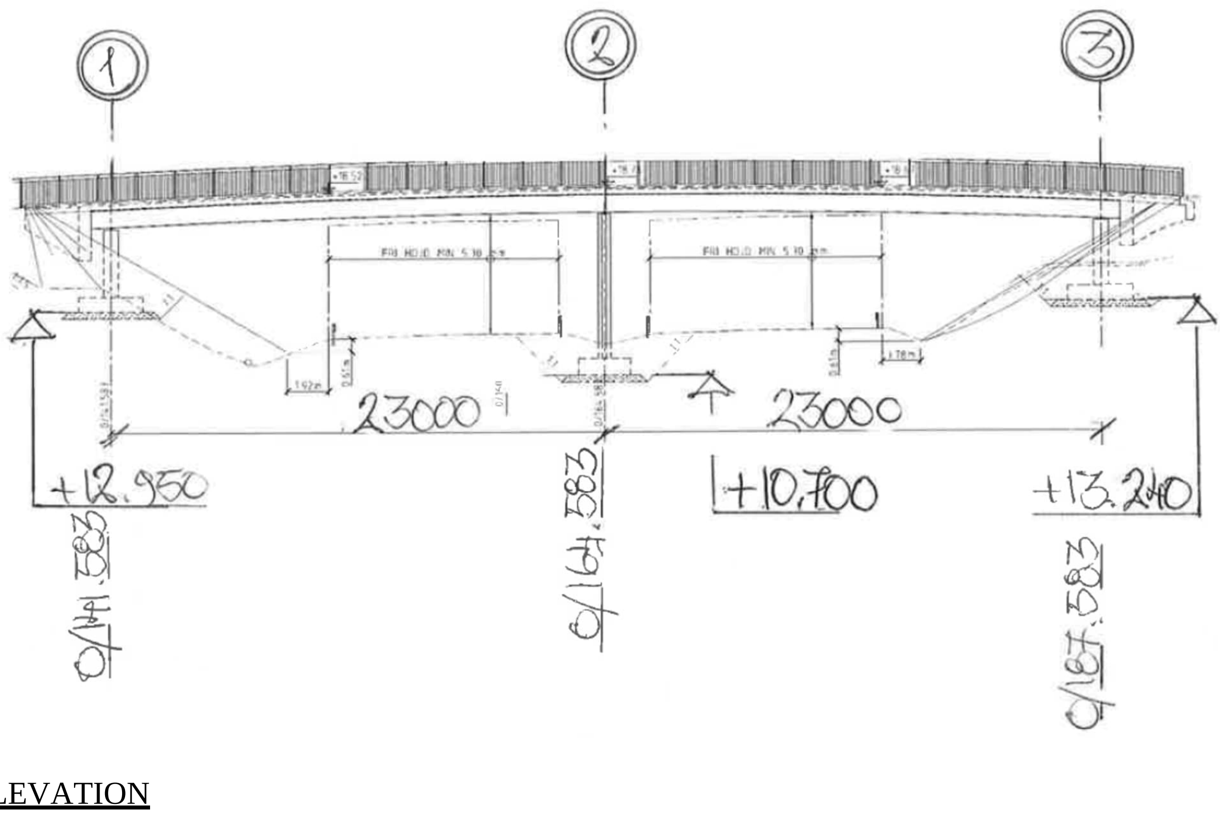
Samverkans bro i stål två spann utförd med 2 st huvudbalkar med ändskärmar i vardera broände.

Grundläggning förutsätt ske med plattgrundläggning. Farbanan gjuts i 3 etapper.

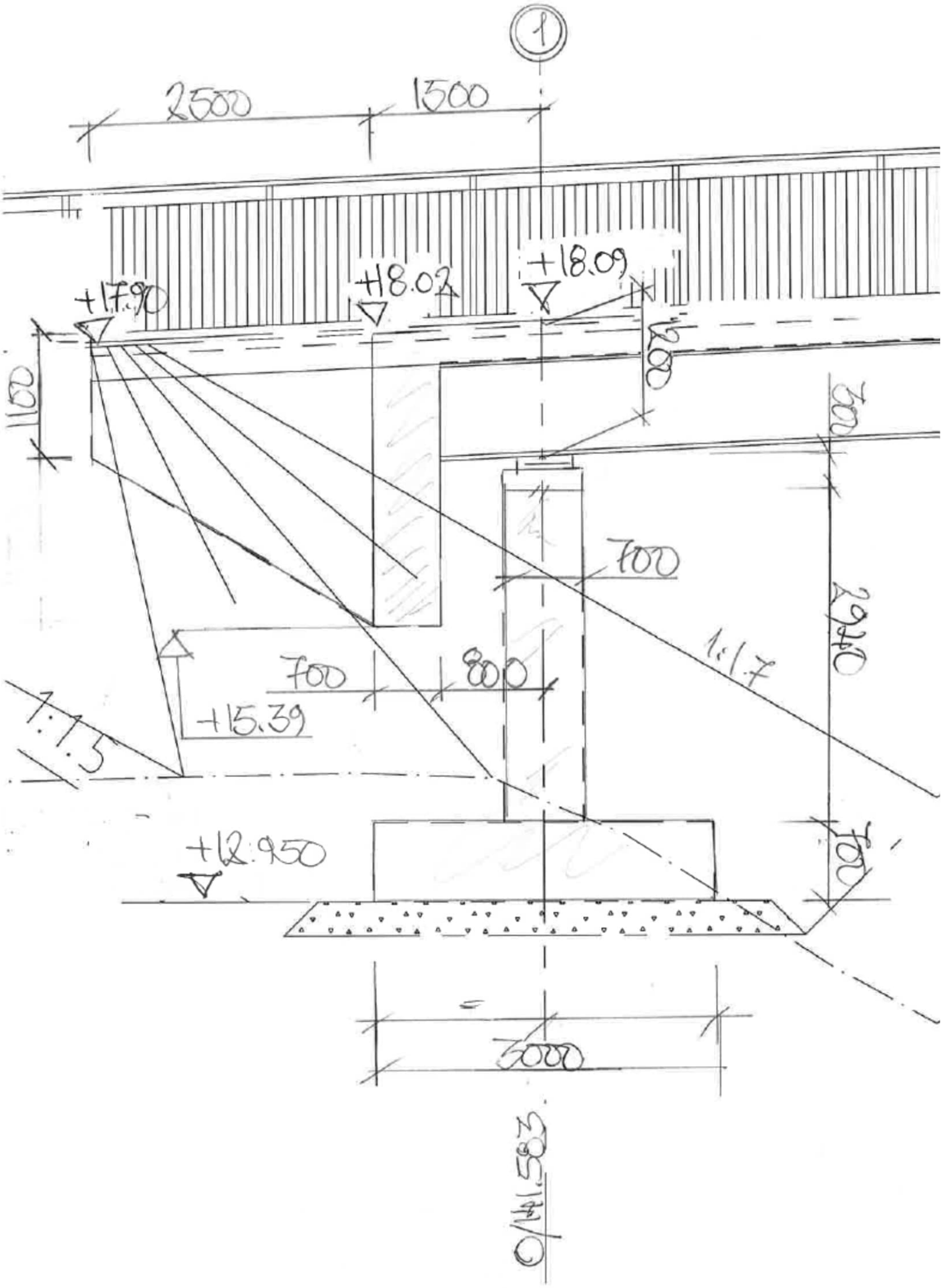
1.2 MÅTT



PLAN



ELEVATION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+18.02
+18.09
1100
200
200
700
700
800
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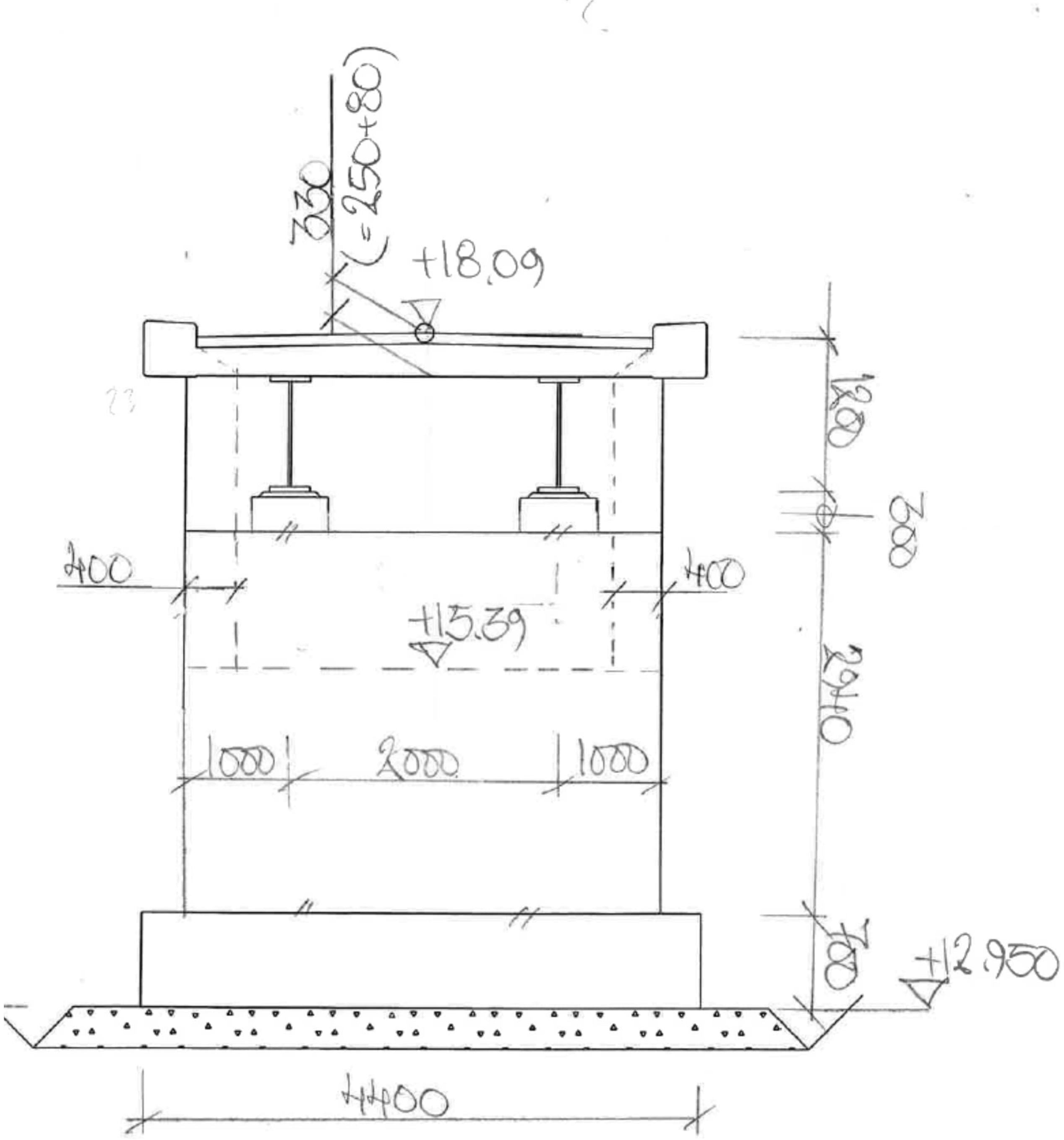
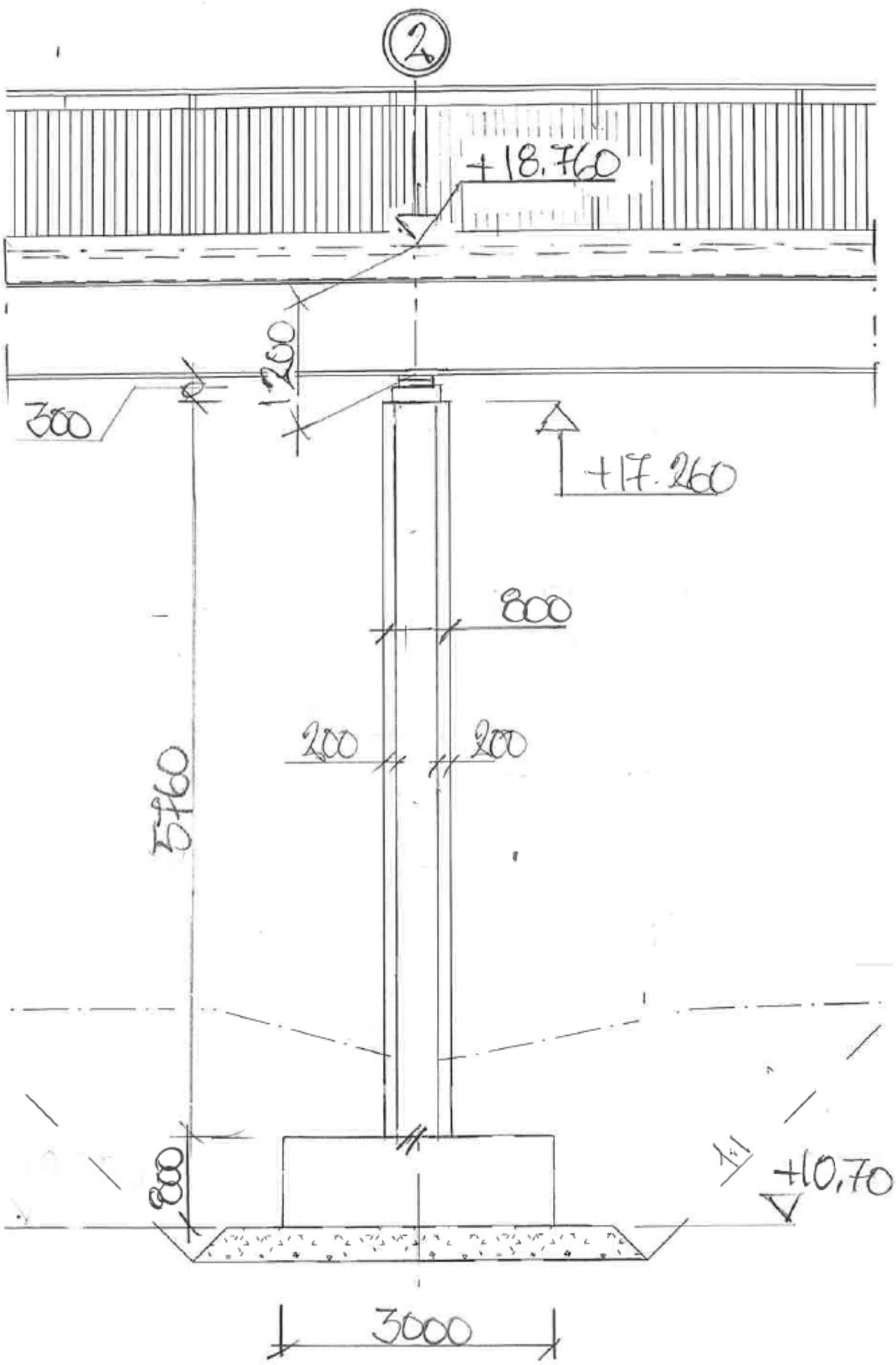
1:1.5
1:1.7
2940
700
+12.950
5000
0/141.585

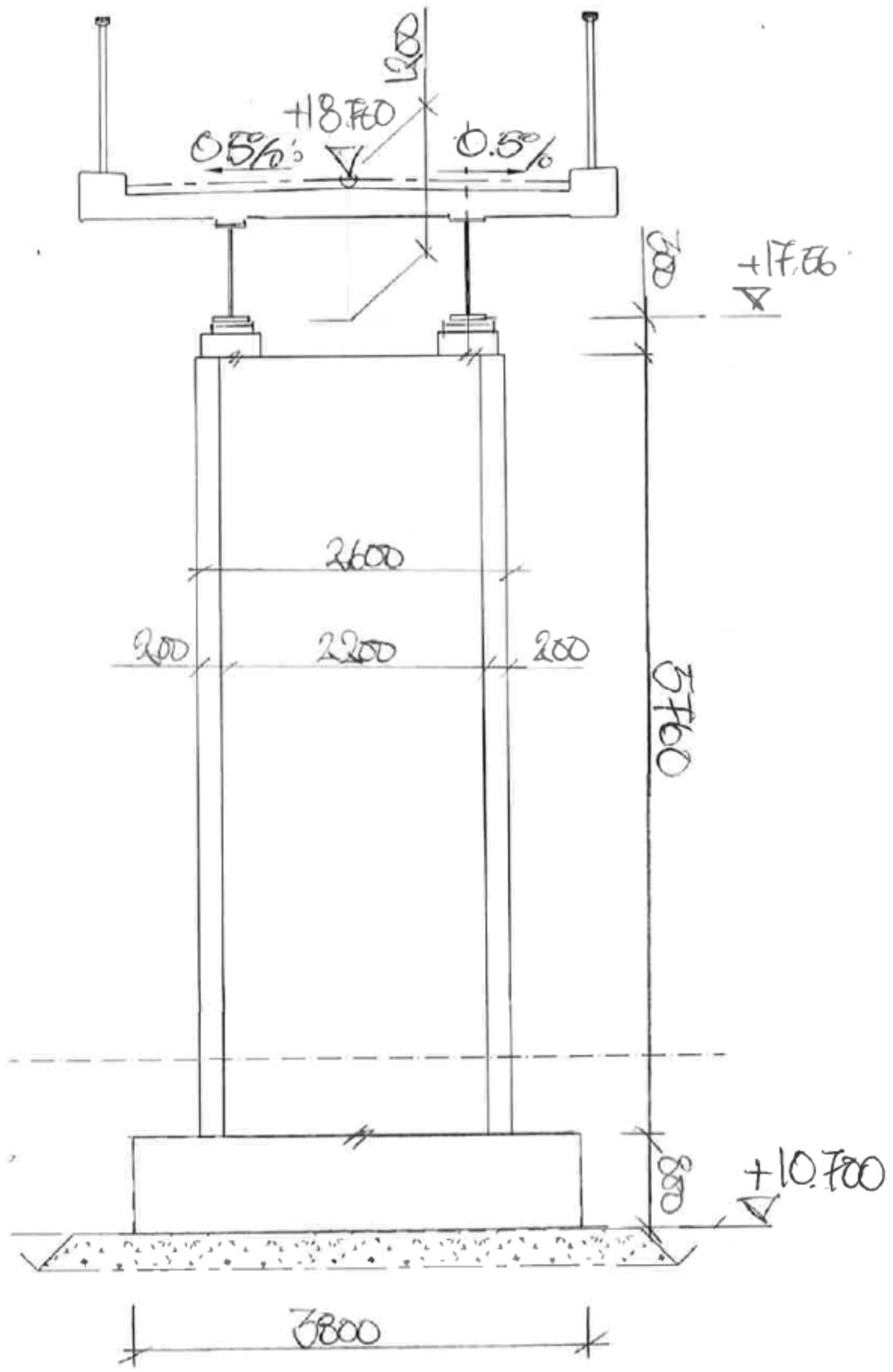
VY STÖD 1



TVÄRSEKTION STÖD 1



VY STÖD 2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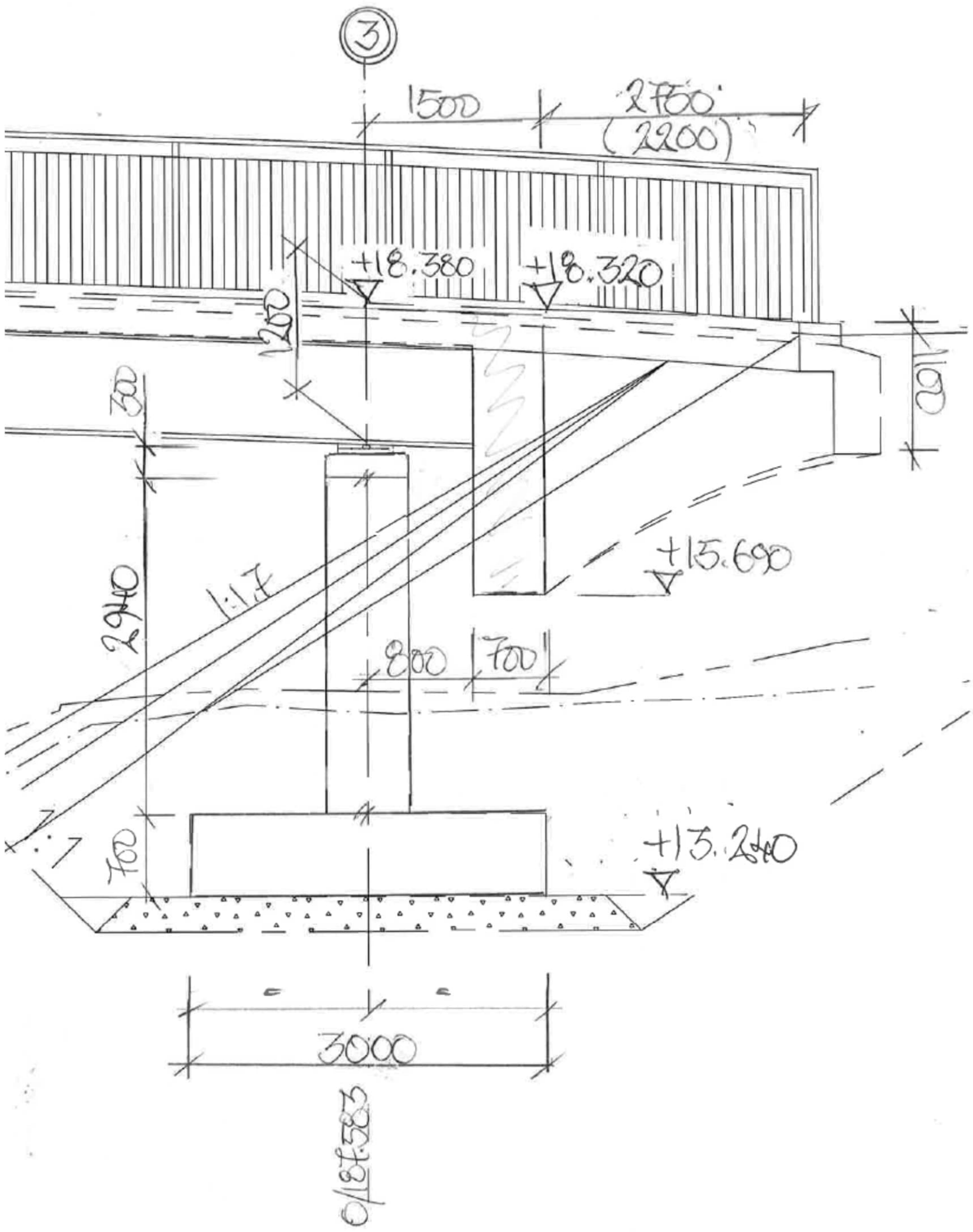
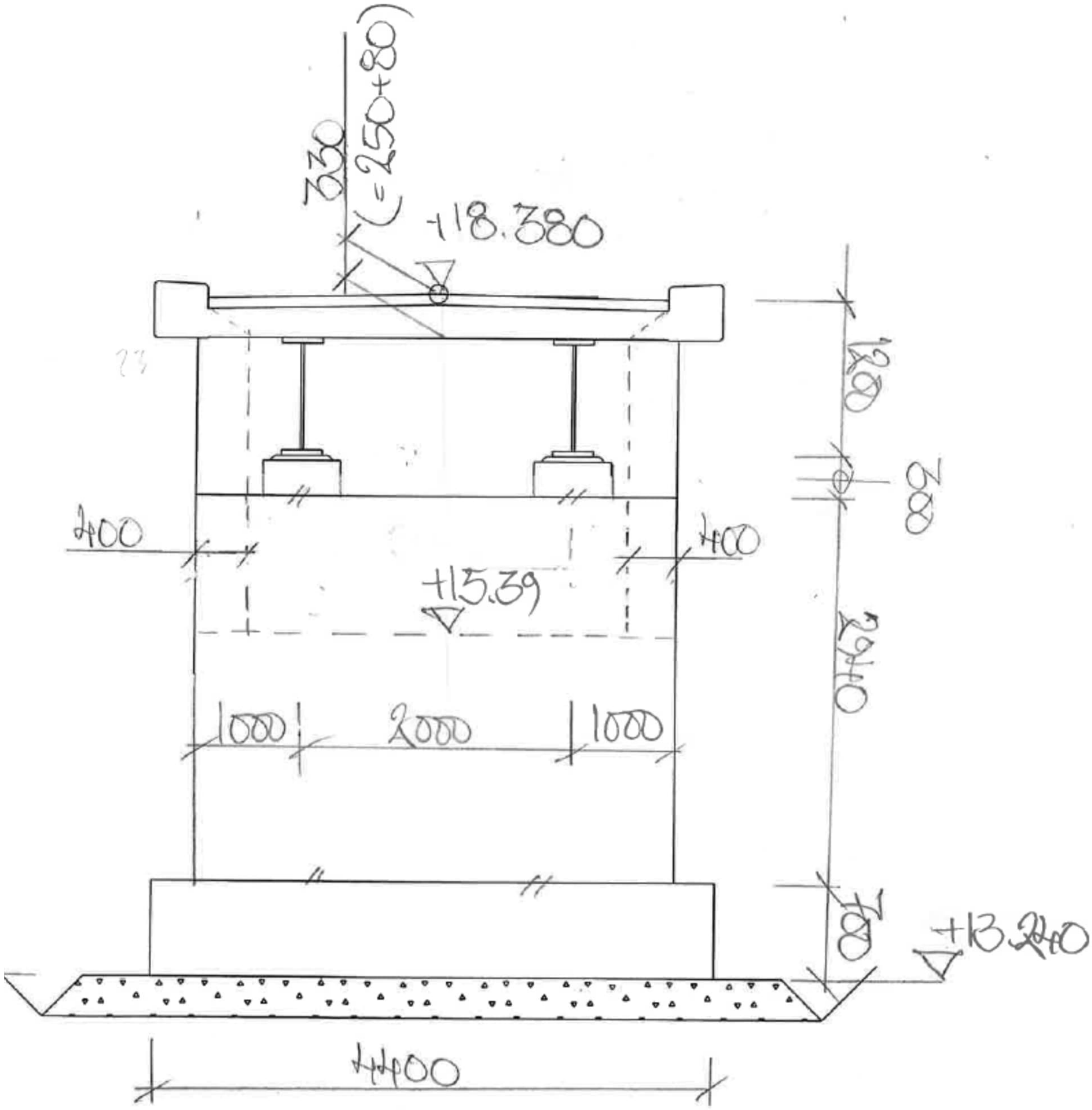
+18.760
0.5%
0.5%
300
+17.56
2600
200
2200
200
5760
800
+10.700
3800

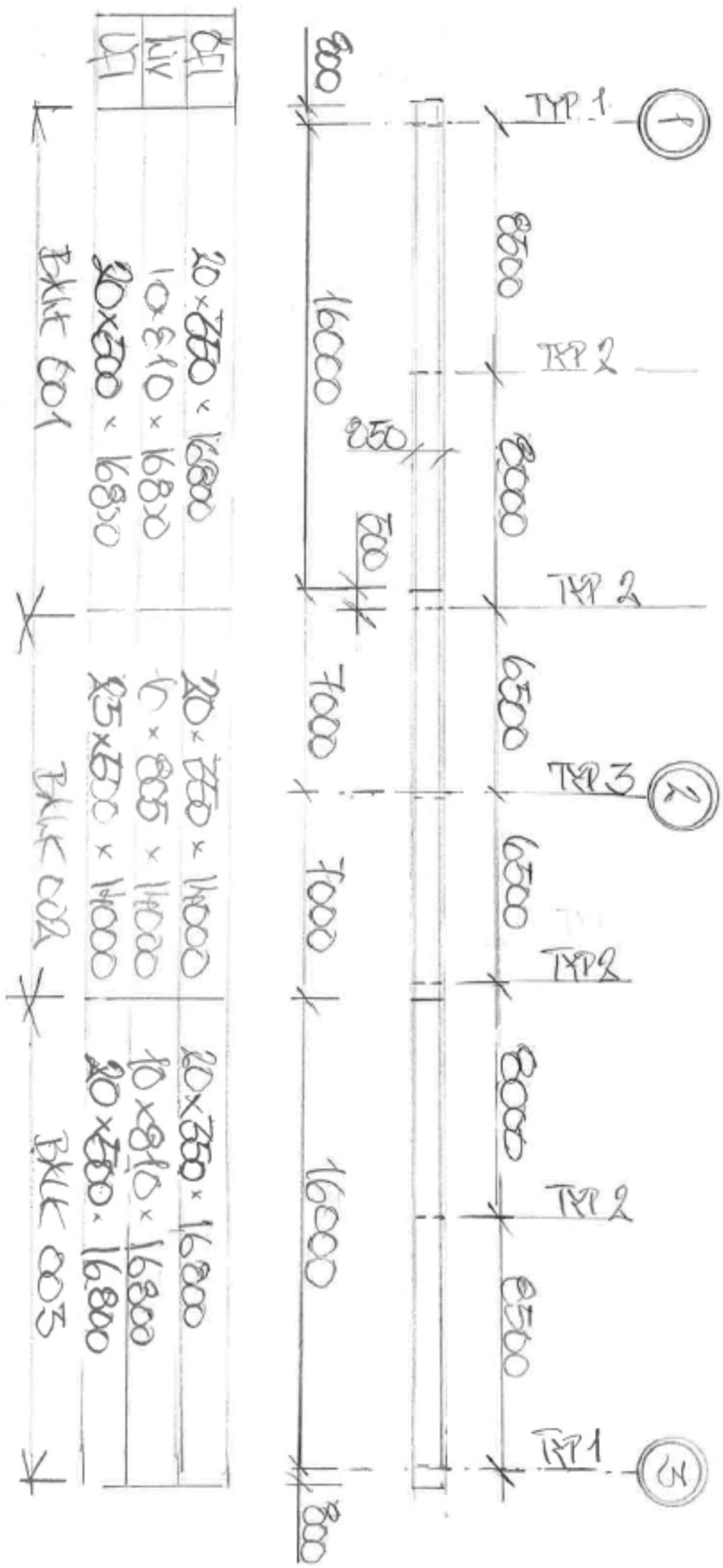
TVÄRSEKTION STÖD 2



VY STÖD 3

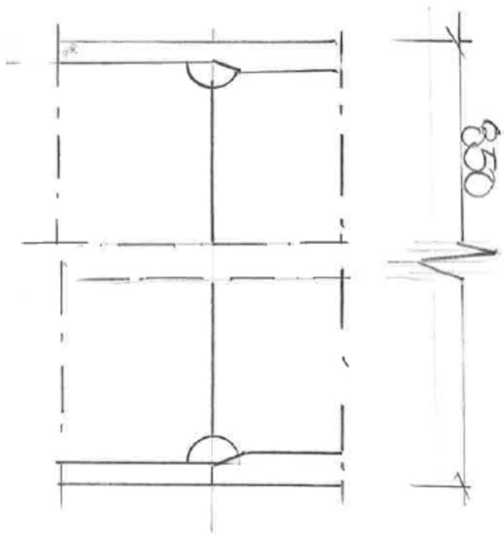


TVÄRSEKTION STÖD 3



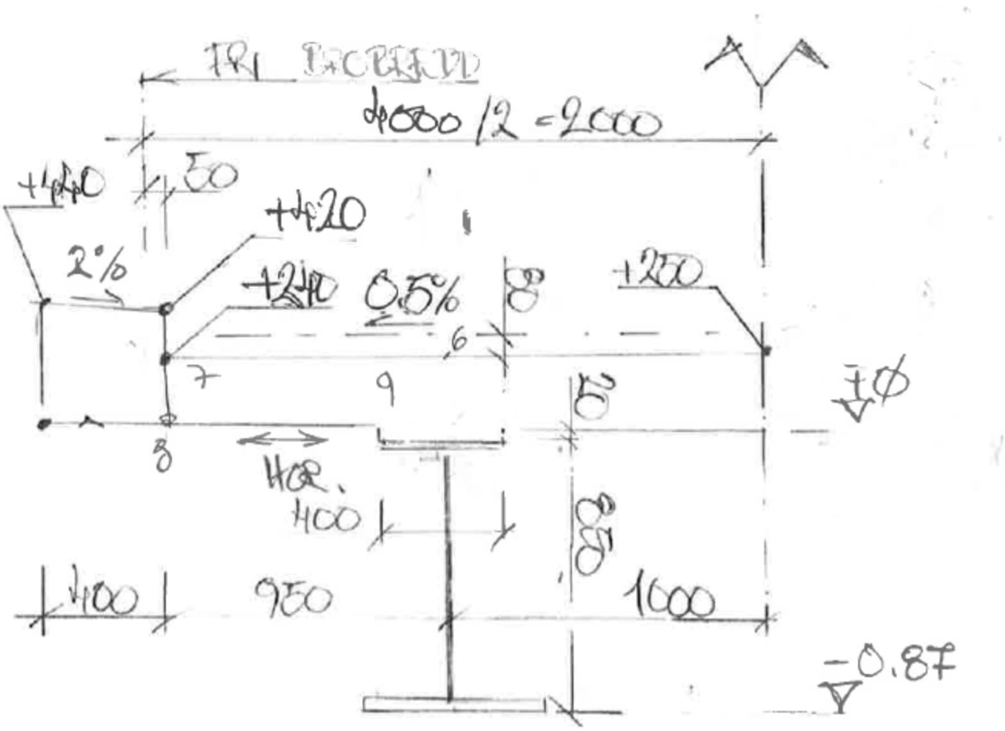
ELEVATION STÅLBALK

BALK 001-003



DETALJ BALKSKARV

MONTAGESKARVAR



TVÄRSEKTION FARBANA

1.3 GRUNDLÄGGNING

Grundläggning av samtliga stöd sker på packad fyllning av sprängsten med minsta tjocklek 0.3 m enligt AMA Anläggning kapitel CEB.411.

Undergrund består av sandig morän på berg.

Grundläggningsnivå stöd 1 : +12.950

Grundläggningsnivå stöd 2 : +10.700

Grundläggningsnivå stöd 3 : +13.240

Dimensionerande grundvattennivåer : + 9.0 → + 11.0

1.4 NORMER OCH FÖRFRÅGNINGSNDERLAG

- TRVK Bro 11 (TRVK Bro publ. 2011:085) inkl. supplement 1
- TRVR Bro 11 (TRVR publ 2011:086) inkl. supplement 1
- 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)
- Sétra Tecnical Guide : Assemement of Vabrational behaviour of footbridges unde pedestrian load (2006)

1.5 TEKNISK LIVSLÄNGD

Teknisk livslängd 100 år gäller för hela bron.

1.6 MILJÖ

Vägmiljö anses råda för underliggande väg. För gång- och cyckelväg gäller GC-miljö.

Miljöer för enskilda betongytor se tabell avsnitt 1.11.

1.7 MATERIAL

Betong : C35/45 i överbyggnad och C30/37 i övrigt.

Armering : K500CT

Stål : Enligt separat redovisning

Motfyllning : Förtärkningslagermaterial enligt AMA CEB.5201

Beläggning : 75 mm PGJA på 5 mm tätskiktsmatta

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 TRVR Bro avsnitt D.1.3 samt SS-EN 206-1.

Klassindelningar bro :

Konstruktionsdel	Säkerhetsklass	Livslängdsklass	Exponeringsklass
Stöd 1 och 3 :			
▫ Skiva under mark	3	L100	XC2/XF3
▫ Skiva över mark	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	XD3/XF4
▫ Skiva	3	L100	XD3/XF4
Överbyggnad :			
▫ Farbana exkl. kantbalk	3	L100	XD1 / XF4
▫ Kantbalk	3	L100	XD1 / XF4
▫ Vingmur mot fyllning	2	L100	XD1 / XF4
▫ Vingmur från fyllning	2	L100	XD1 / XF4
▫ Ändskärm mot fyllning	3	L100	XD1 / XF4
▫ Ändskärm från fyllning	3	L100	XC2 / 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

Konstruktionsdel	ζ [1.)]	w_k [2.)]	vct_{ekv} [3.)]	$c_{min.dur}$ [3.)]	$c_{min.b}$ [4.)]	c_{min}	Δc_{dev}	c_{nom} [5.) 6.)]
Stöd 1 och 3 :								
▫ Skiva under mark	1.0	0.40	0.50	15	40	40	10	50
▫ Skiva över mark	1.2	0.30	0.50	20	40	40	10	50
▫ UK bottenplatta	1.0	0.40	0.50	15	40	40	10	100
▫ 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	10	100
▫ Bottenplatta i övrigt	1.8	0.15	0.40	45	40	45	10	55
▫ Skiva	1.8	0.15	0.40	45	40	45	10	55
Överbyggnad :								
▫ Farbana exkl. kantbalk	1.5	0.20	0.40	25	40	40	10	50
▫ Kantbalk	1.5	0.20	0.40	25	40	40	10	50
▫ Vingmur	1.5	0.20	0.40	25	40	40	10	50
▫ Ändskärm mot fyllning	1.5	0.20	0.40	25	40	40	10	50
▫ Ändskärm från fyllning	1.0	0.40	0.50	15	40	40	10	50
	-	mm	-	mm	mm	mm	mm	mm

Fotnoter

1.) Enligt SS-EN 1992-1-1 bilaga NA §7.3.2 tabell c
2.) Enligt SS-EN 1992-2 bilaga NA §7.3.1 tabell 7.1S
3.) Minsta betongskikt av miljöpåverkan enligt SS-EN 1992-1-1 bilaga NA §4.4.1.2 tabell a/4.4S
4.) Minsta betongskikt av vidhäftning enligt SS-EN 1992-1-2 §4.4.1.2 motsvararande max{ϕ; stenmax+5mm}. Erhållet värde avrundas uppåt.
5.) Nominell tjocklek som anges på ritning.

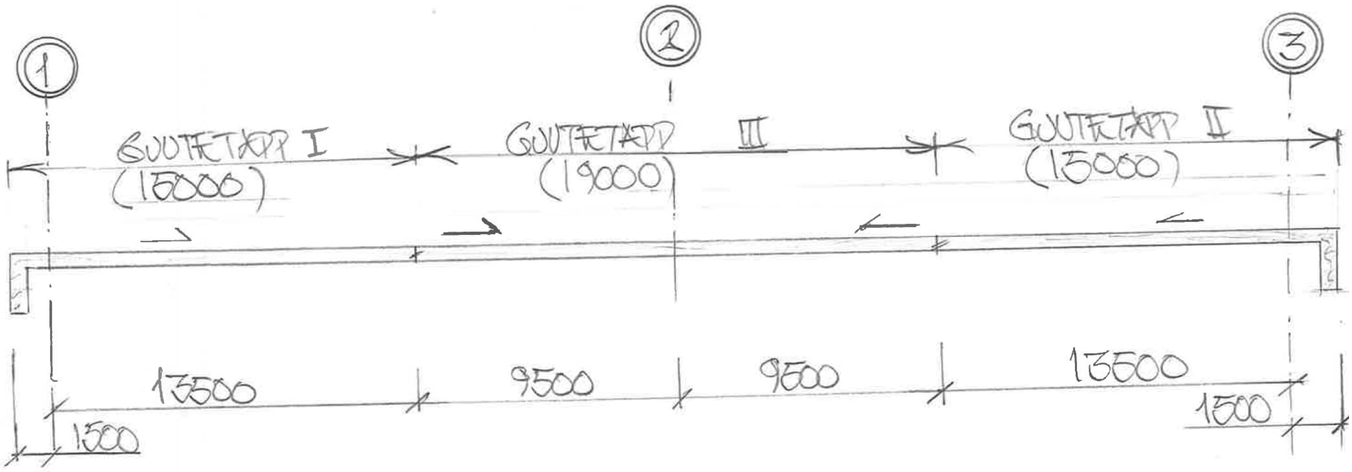
6.) Vid gjutning direkt mot fyllning ska de nedre 50 mm betraktas som statisk overksam enligt TRVK Bro D.2.2.1.4 och TRVR D.1.3.3 ⇒ $c_{nom} = c_{min} + \Delta c_{dev} + 50mm$

Stenmax = 32 mm → $c_{min,b}$ = 37 mm men 40 mm väljs på säker sida !

1.11 GJUTORDNING

Farbanan gjuts i 3 etapper enligt redovisning nedan.

Gjutetapp I : Ändskärm och vingmurar vid stöd 1 + farbana med front mot stöd 2.
Gjutetapp II: Ändskärm och vingmurar vid stöd 3 + farbana med front mot stöd 2.
Gjutetapp III : Farbana med 2 fronter samtidigt mot stöd 2.



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 ”$\xi \cdot d$”.

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

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:

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

2. STATISKT SYSTEM

2.1 ALLMÄNT

Bron är en samverkansbro i stål. Bro är utförd i ett spann med 2 st identiska huvudbalkar i stål. Dessa är uppbyggda av BALK 001-003 som även betecknas Segment A-C.

Fullständig samverkan mellan huvudbalkar och betongfarbana förutsätts.

Bron grundläggs genom plattgrundläggning. Då ändstöd är försedda med ensidigt rörliga lager så modelleras inte dessa i den statiska modellen.

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 program* 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 5 st etapper för de olika statiska systemen. Dessa betecknas Stage I, II, III, 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.

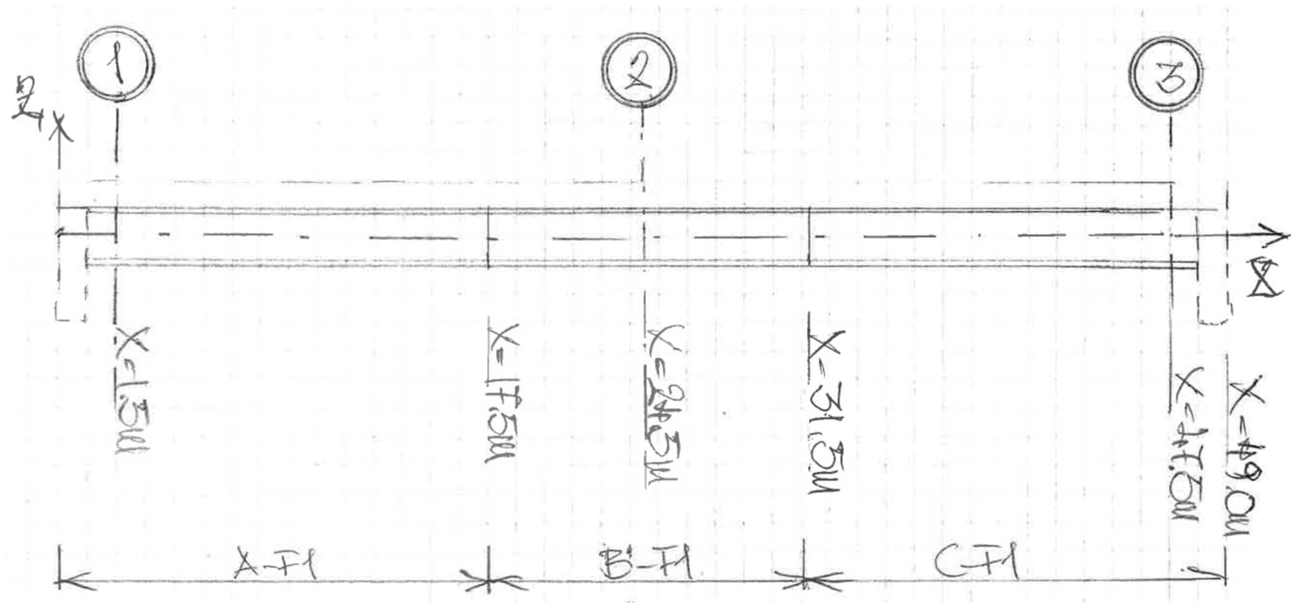
FEM program fungerar ar även ett fristående beräkningsprogram som fungerar som ”SK94” dvs bestämmer tvärsnittskonstanter.

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 ske när $\sigma_{SLS\text{-}K} > 2f_{ctm}$. Se EC4-2 avsnitt 5.4.2.3 och 1.5.2.12.

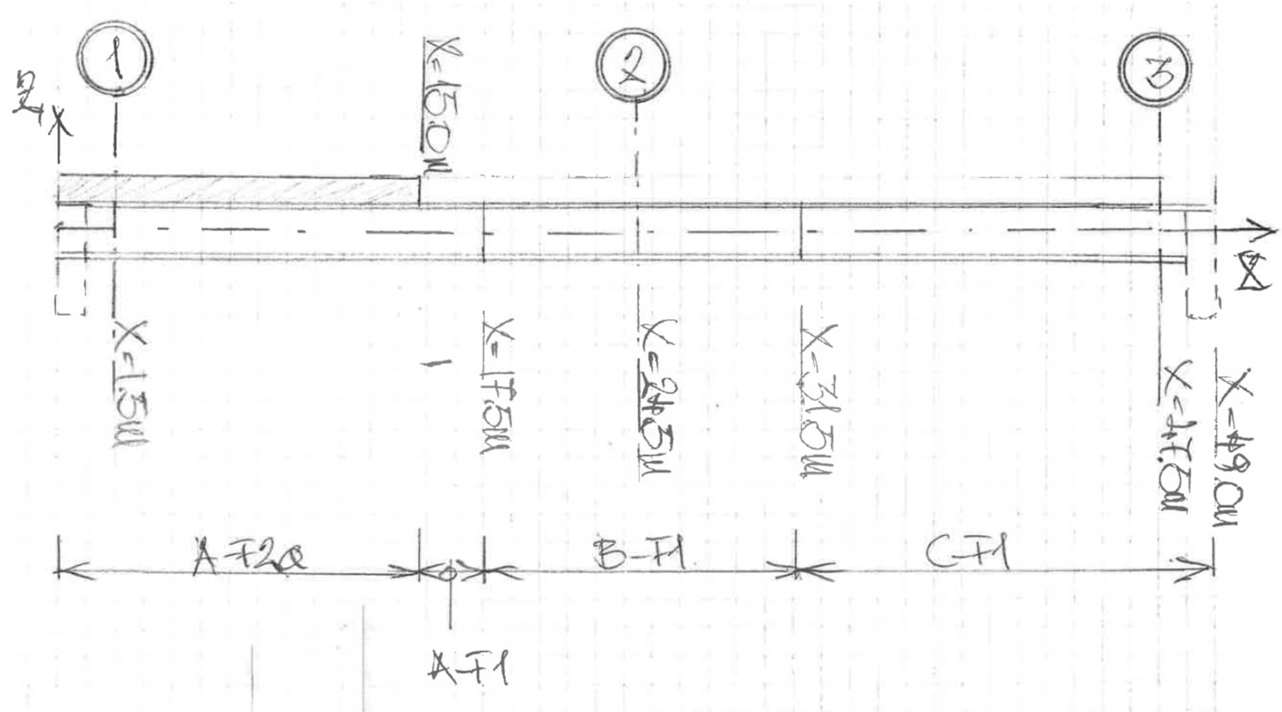
Analysis	Skede	Gjutetapp
Stage I	Bygg	I
Stage II	Bygg	II
Stage III	Bygg	III
Drift-P	Drift	-
Drift-V	Drift	-

Bilagor

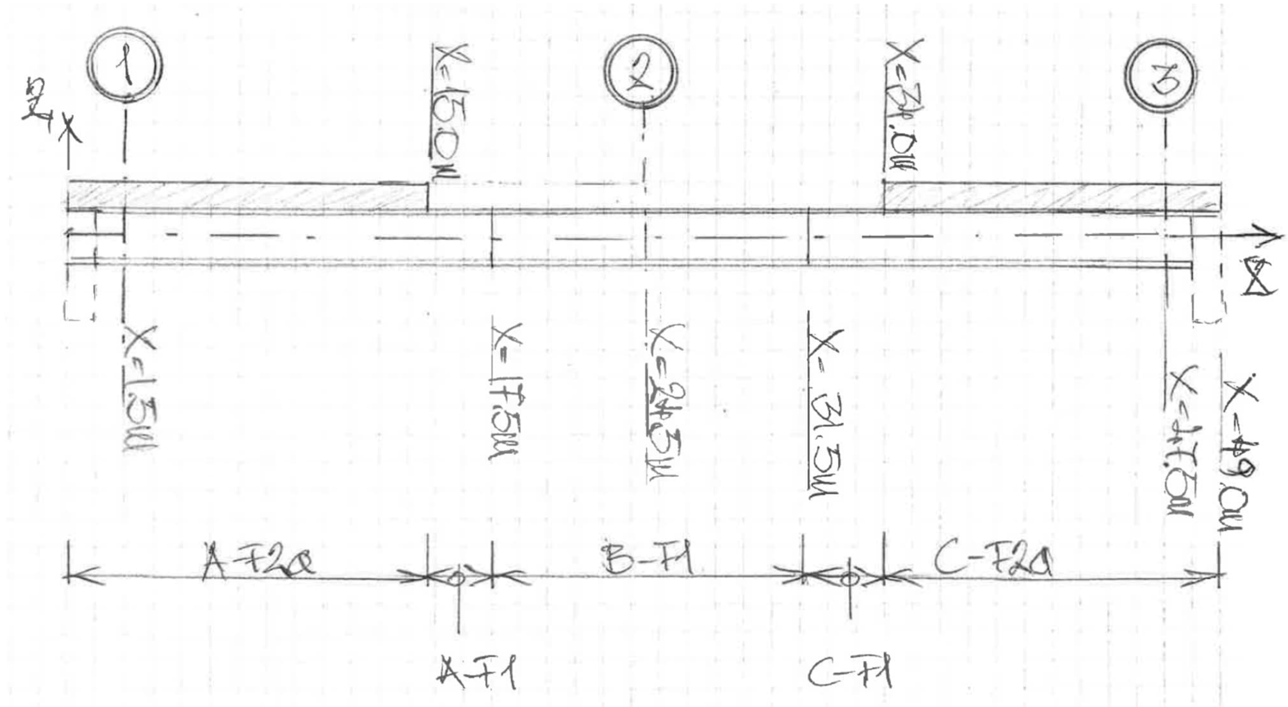
Bilaga 1 - Indatakvitto SYSTEM 001
Bilaga 2 - Resultat SYSTEM 001 (reaktionskrafter)
Bilaga 3 - Resultat SYSTEM 001 (snittkrafter)



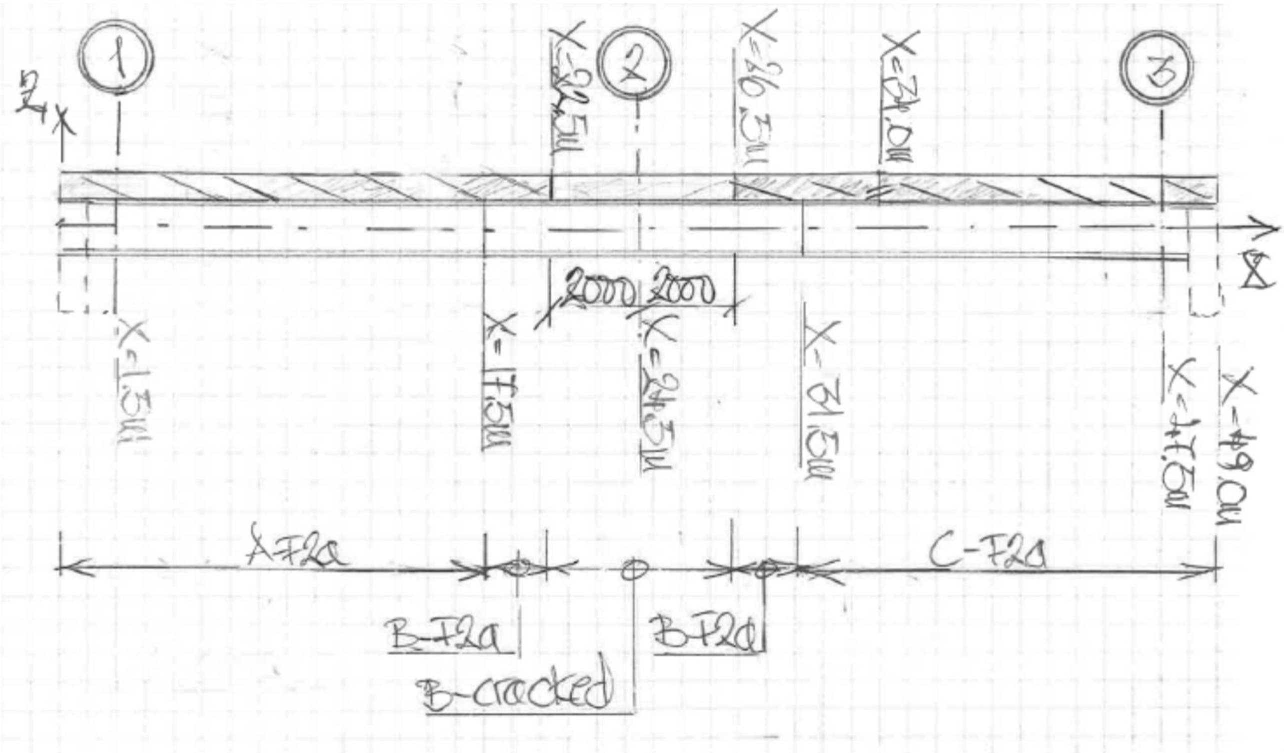
Analysis : Stage I
(Byggskede : Våt betong gjutetapp I)



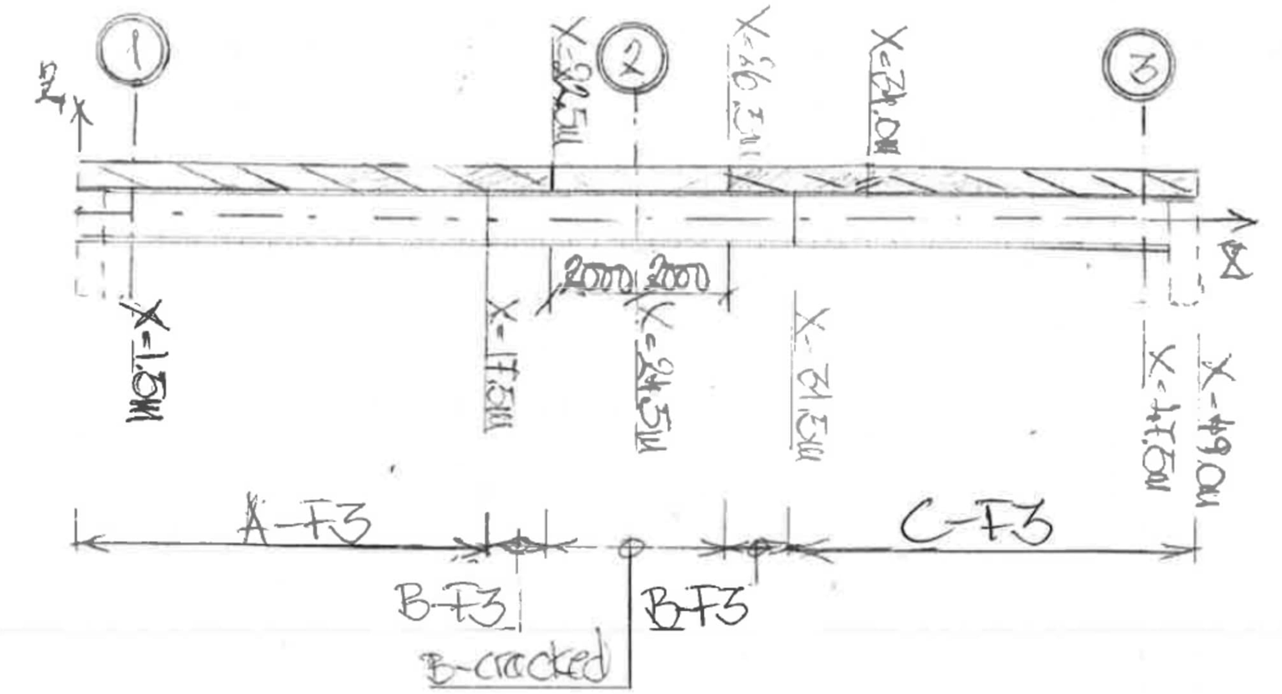
Analysis : Stage II
(Byggskede : Våt betong gjutetapp II)



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



<u>Analysis : Drift-P</u>
(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 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*.

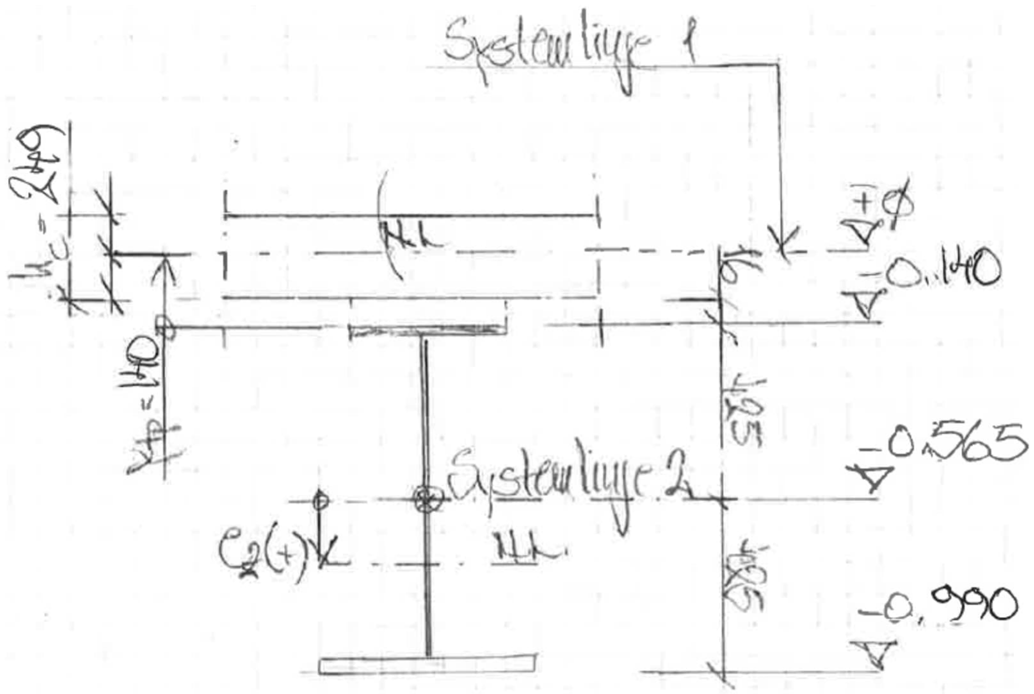
Bifogade bilder är hämtade ifrån gjord analys och ger en grafisk kvittens av *POINTS*, *LINES* och *SURFACES.*

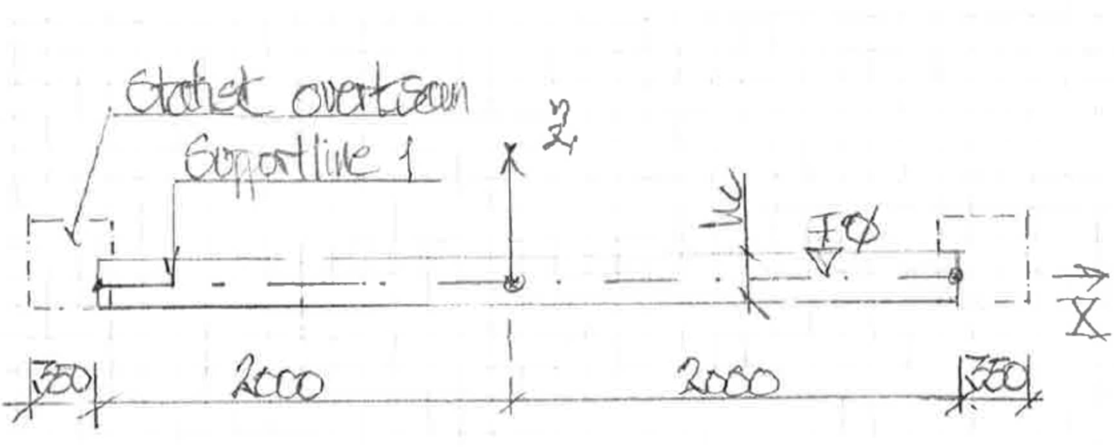
Alla koordinater för att beskriva *POINTS* återfinns i bilaga 1.

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

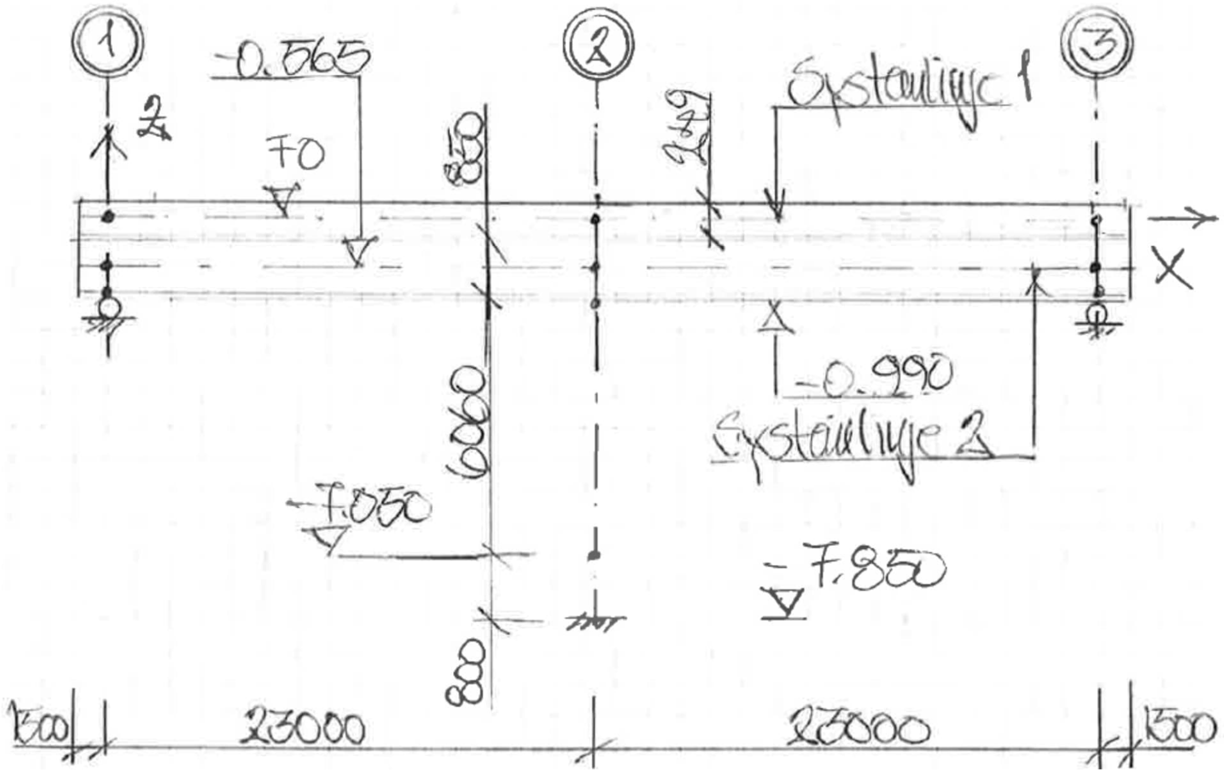
Samtliga *LINES* som beskriver *SURFACES* återfinns i bilaga 1.

Överbyggnad modelleras med totalt 2 st systemlinjer belägna på fiktiva nivåer enligt redovisning nedan.

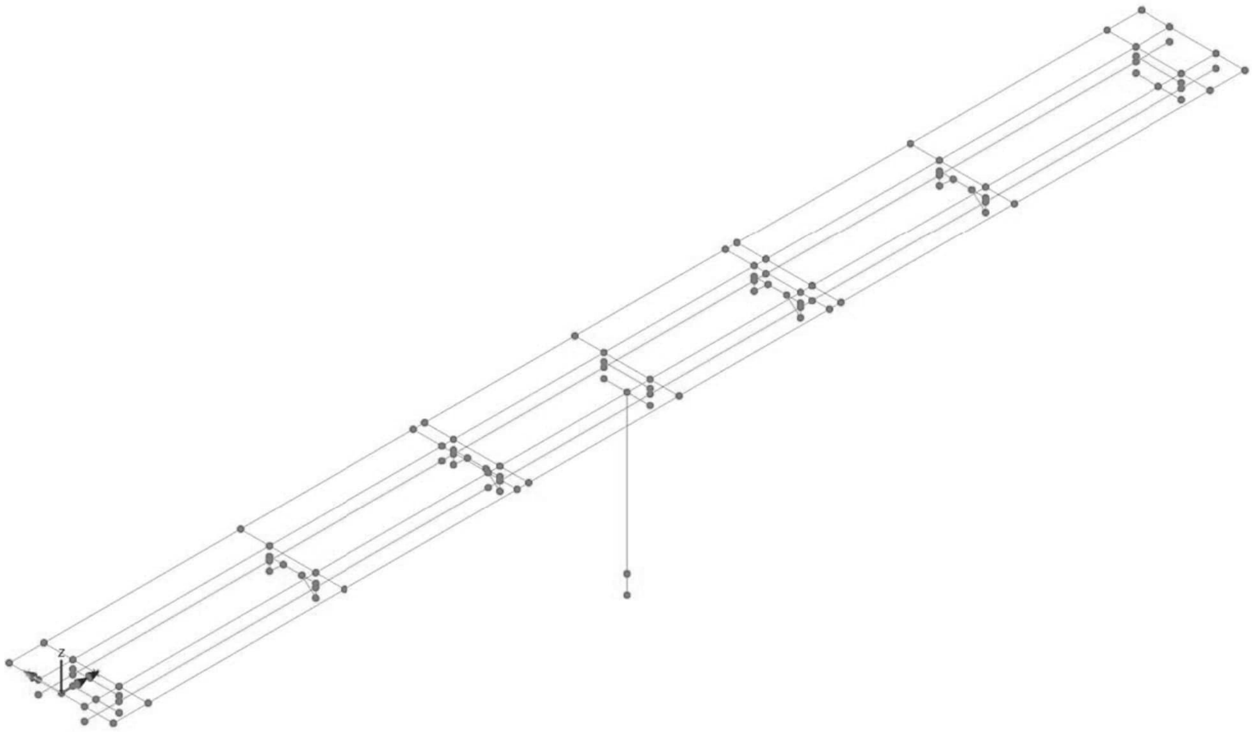




Underbyggnad och lager modelleras med de fiktiva nivåer enligt redovisning nedan.

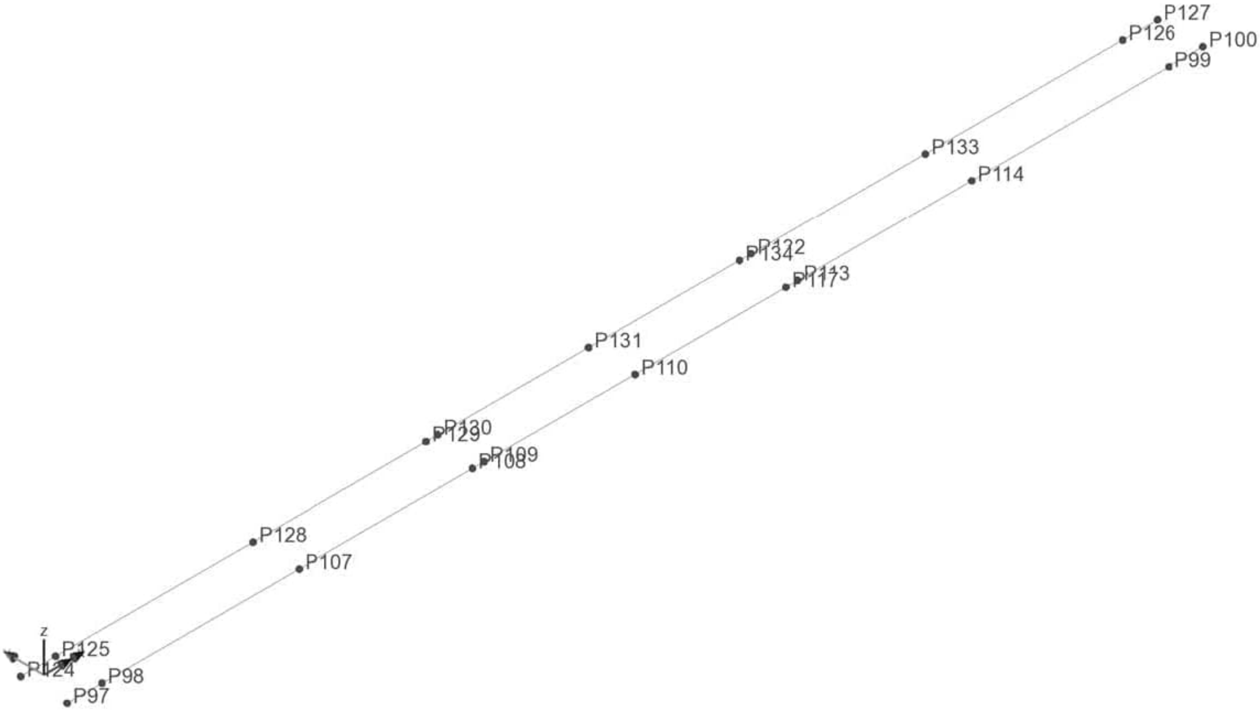


Overview :

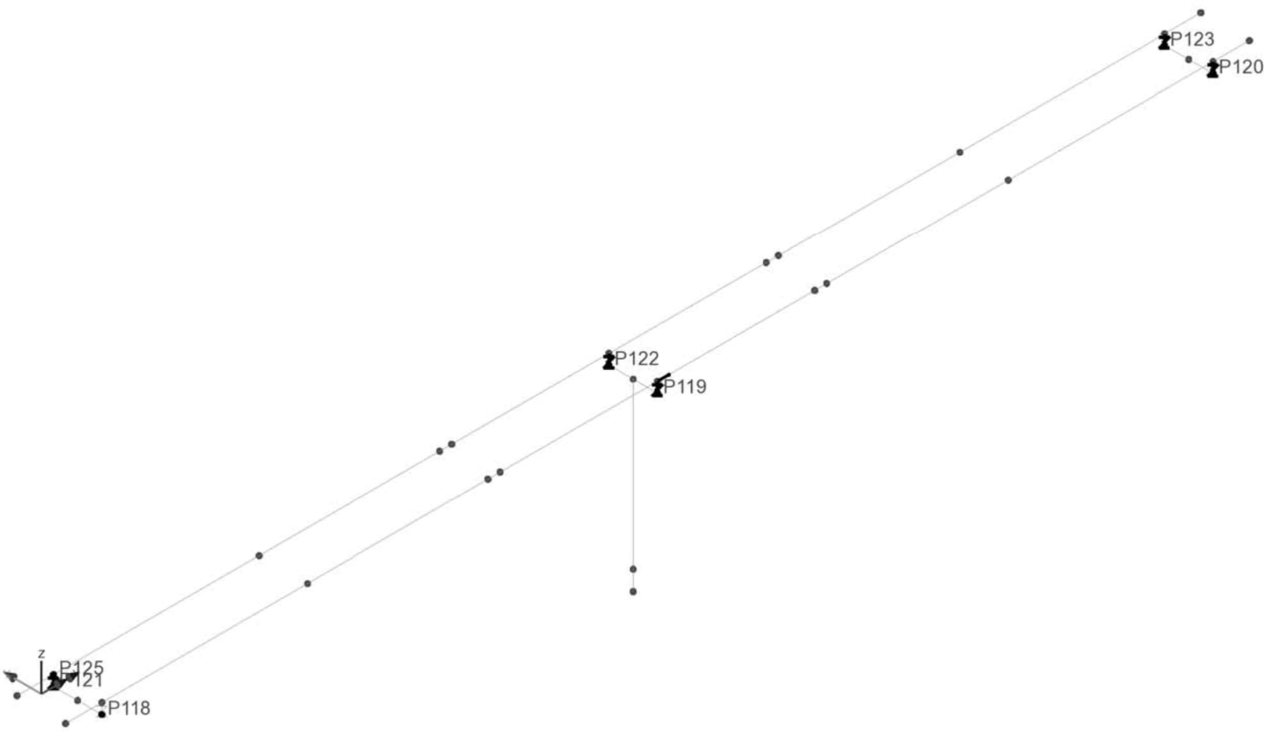


2.2.1.1 Geometri : POINTS

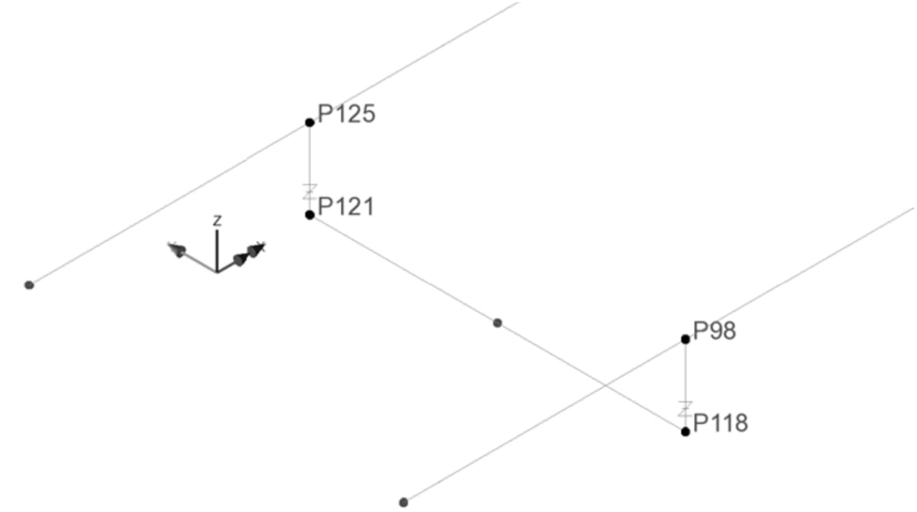
Main beams :



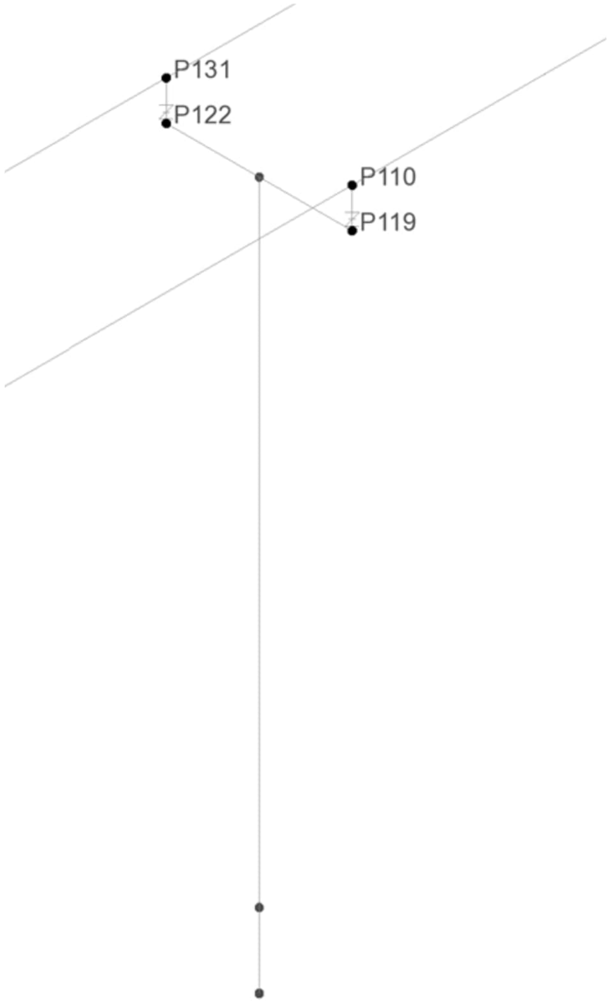
Bearings - overview :



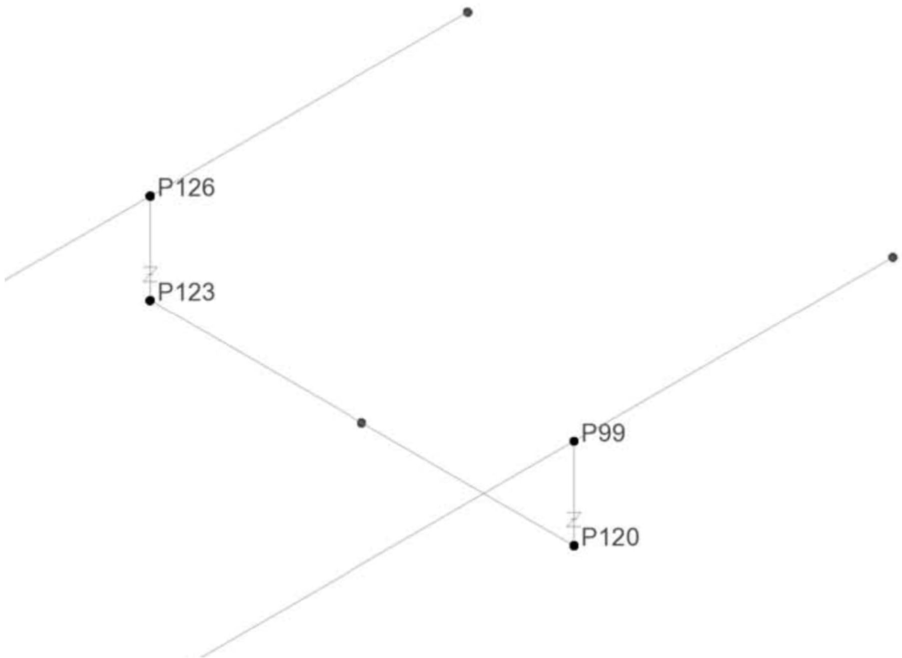
Bearings – supportline 1 :



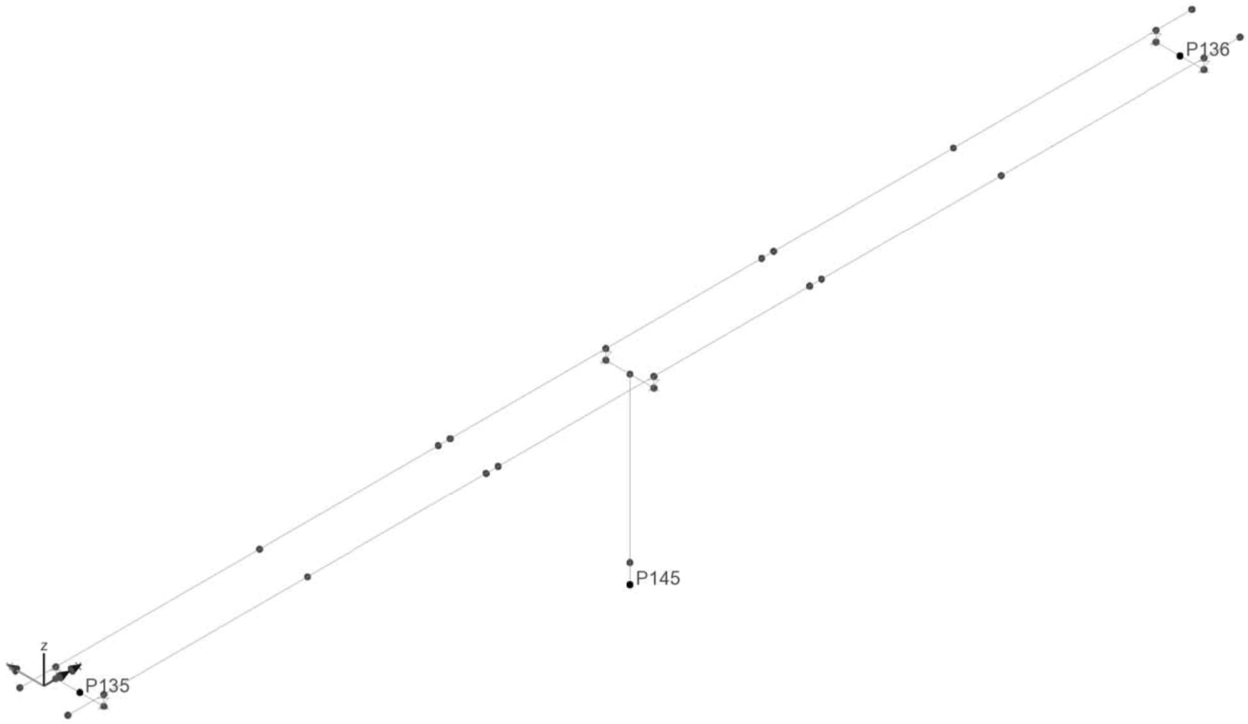
Bearings – supportline 2 :



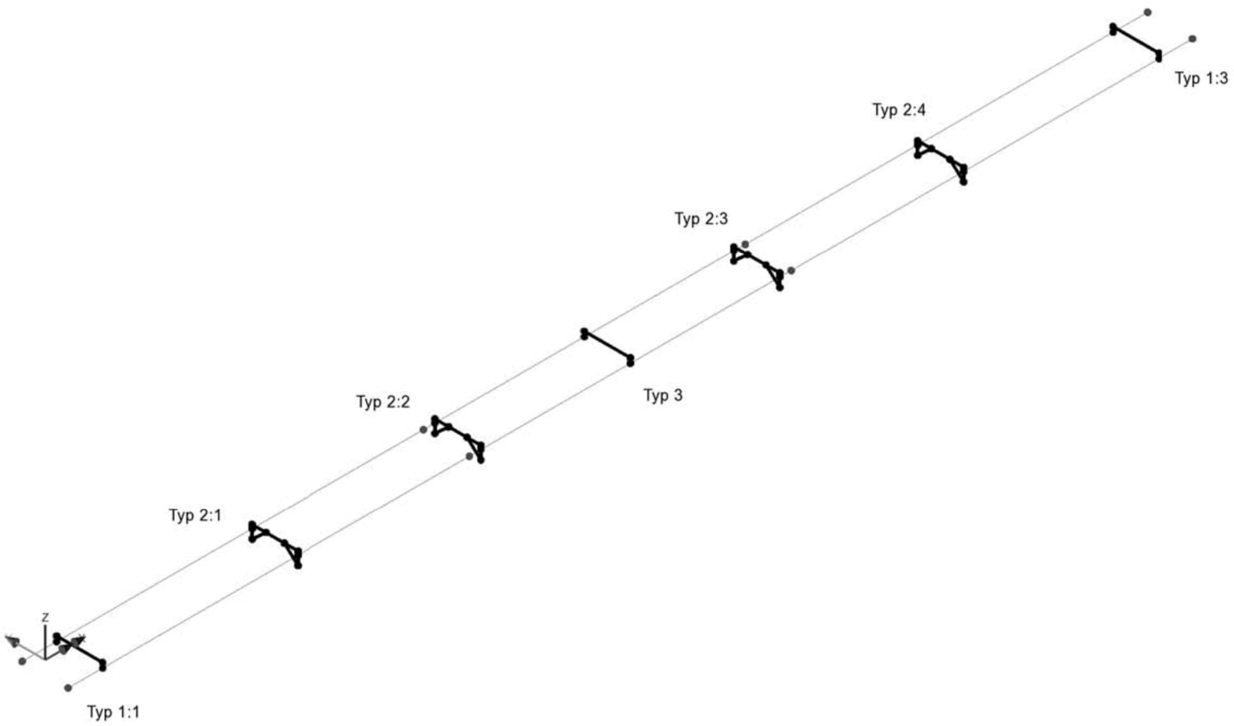
Bearings – supportline 3 :



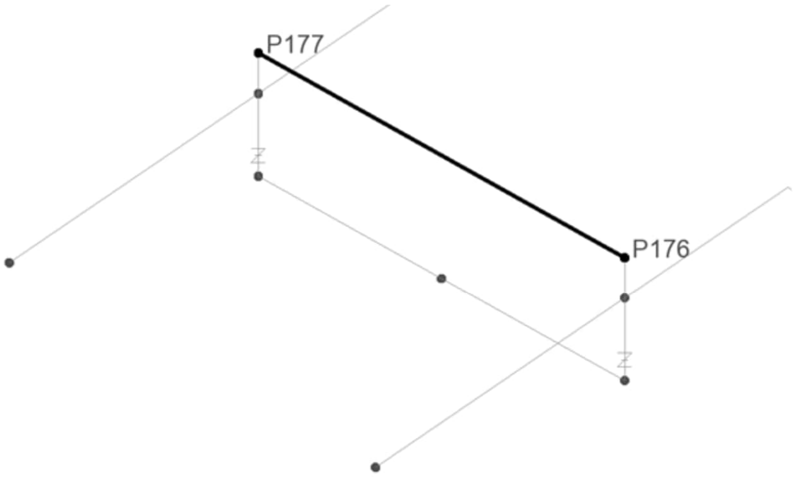
Supports - overview :



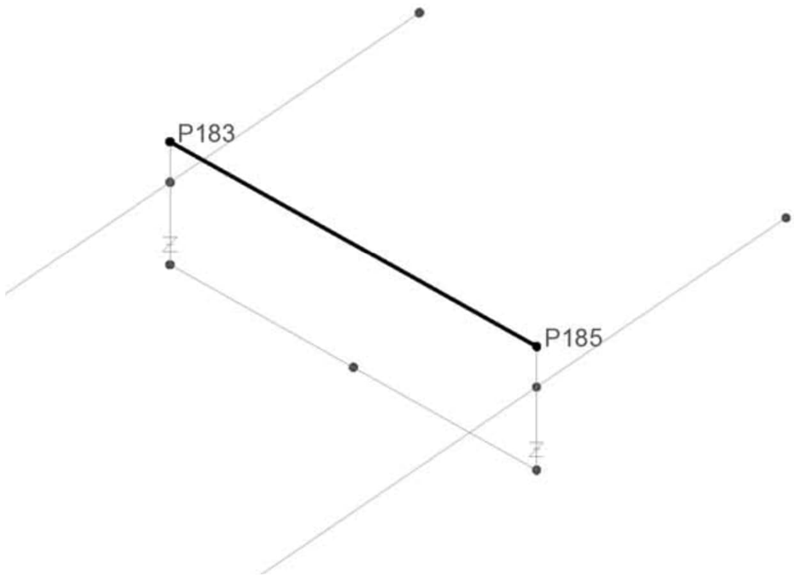
Diaphragms - overview :



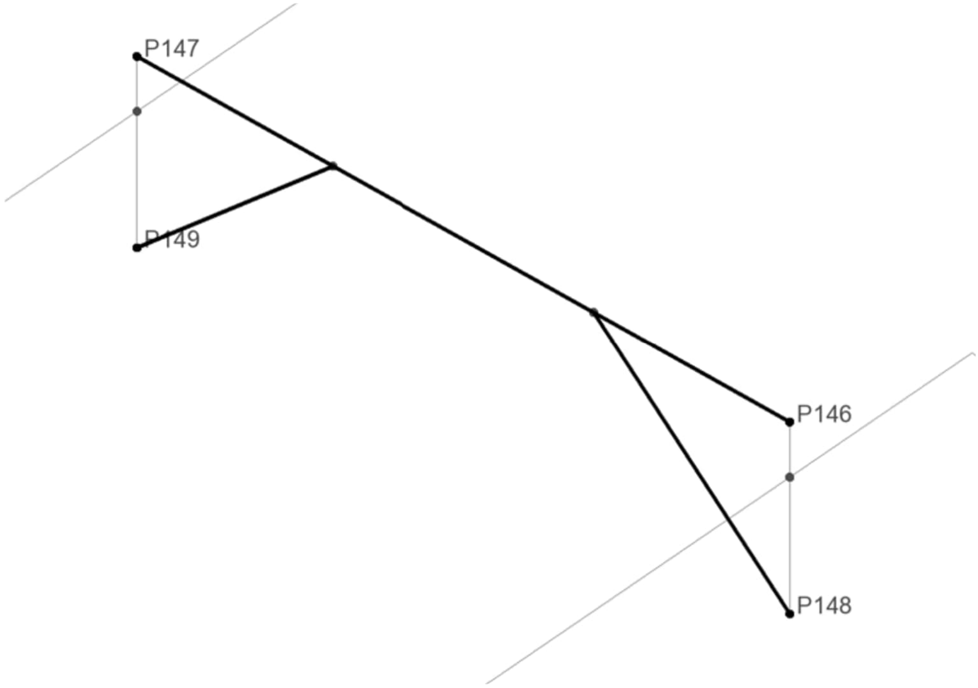
Diaphragm – Typ 1:1 :



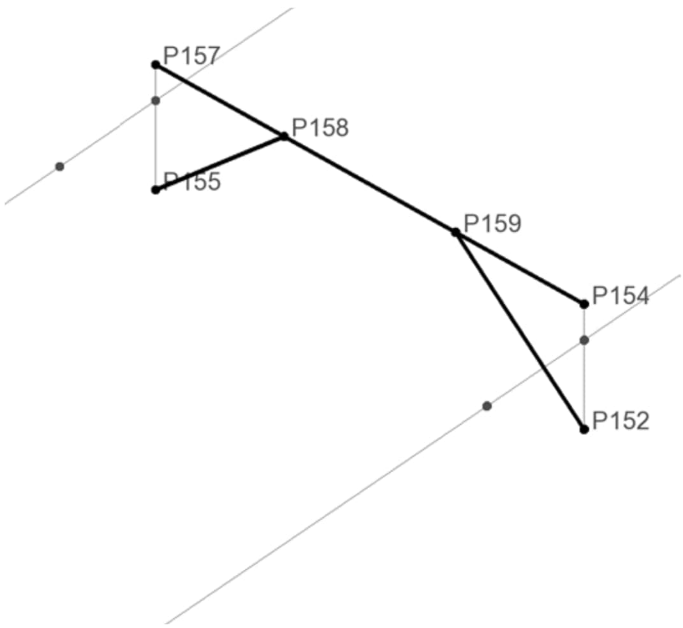
Diaphragm – Typ 1:3 :



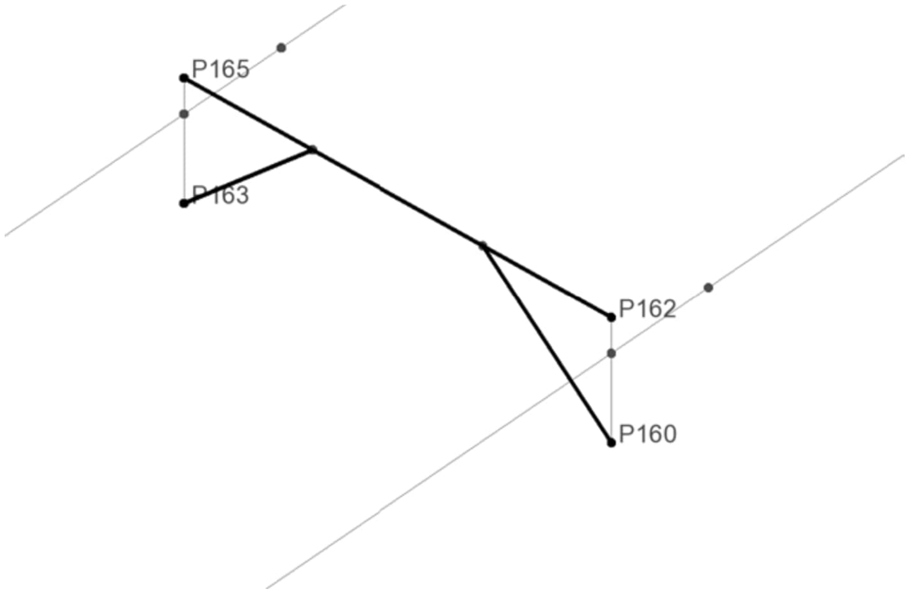
Diaphragm – Typ 2:1 :



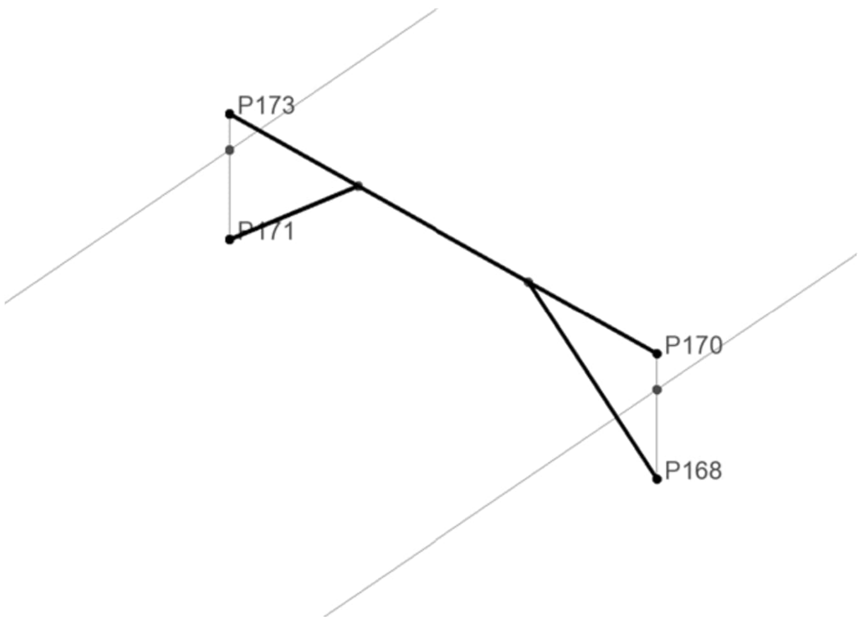
Diaphragm – Typ 2:2 :



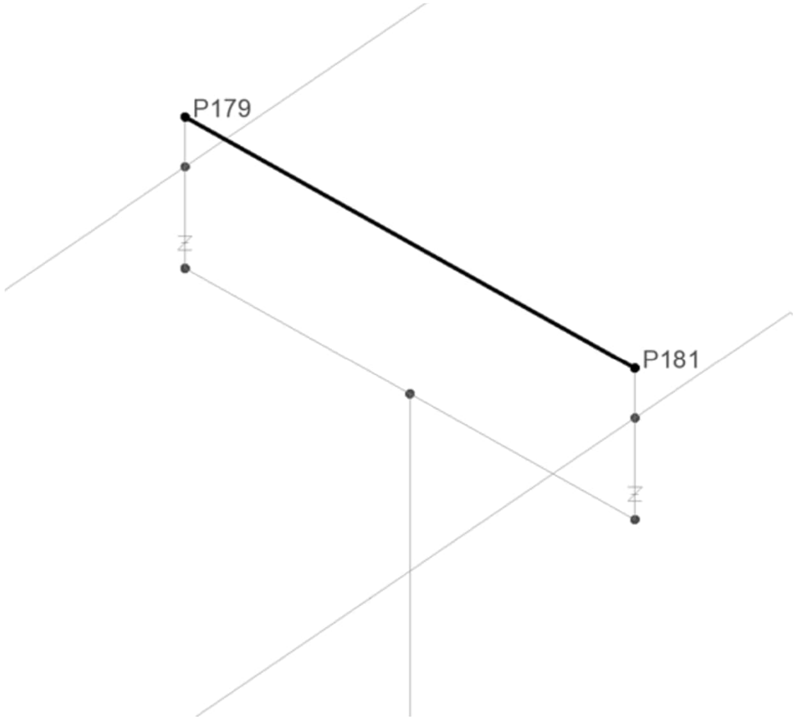
Diaphragm – Typ 2:3 :



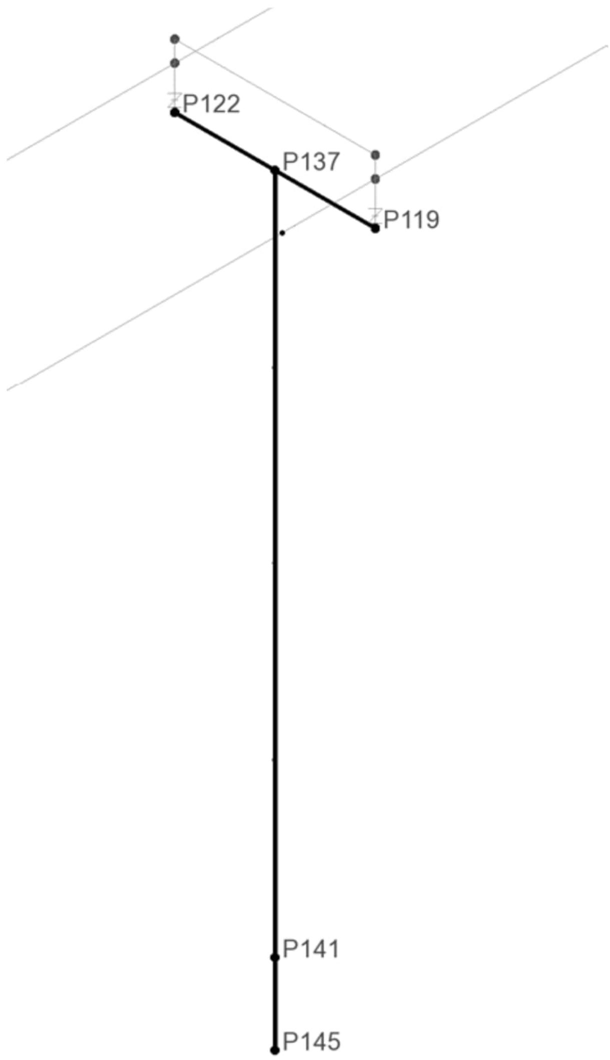
Diaphragm – Typ 2:4 :



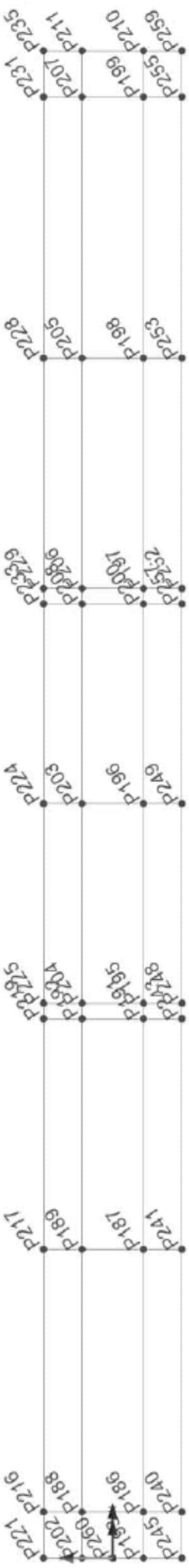
Diaphragm – Typ 3 :



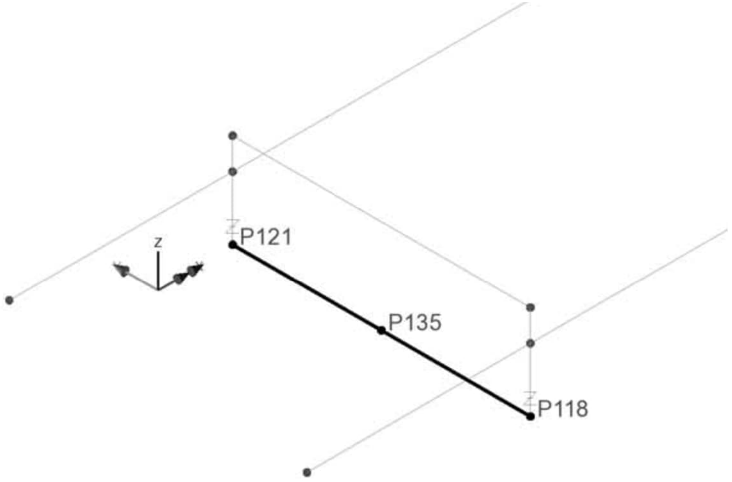
Substructure – supportline 2 :



Deck :

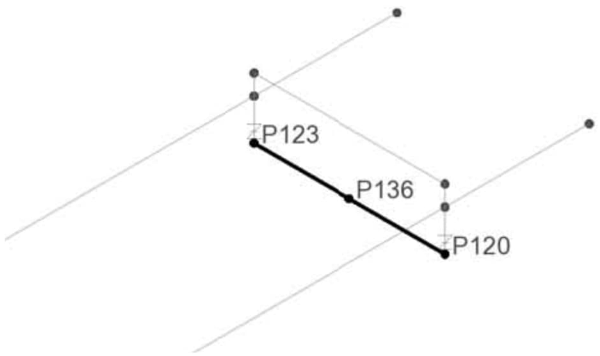


Rigid beam – supportline 1 :

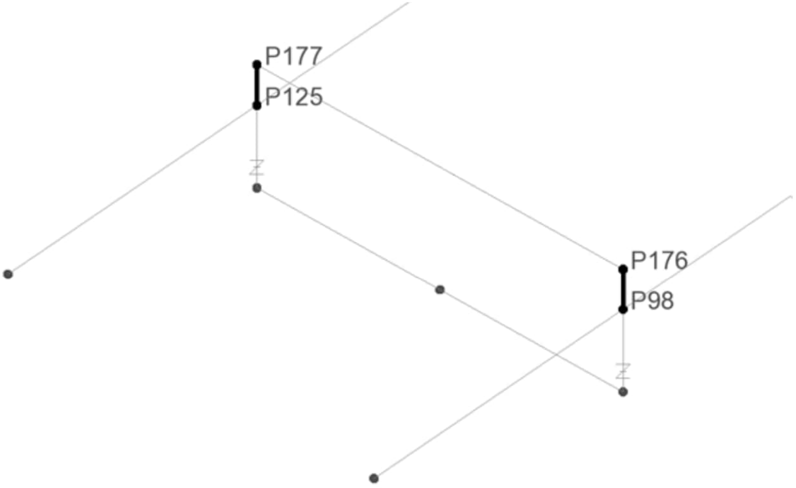


Rigid beam – supportline 2 :

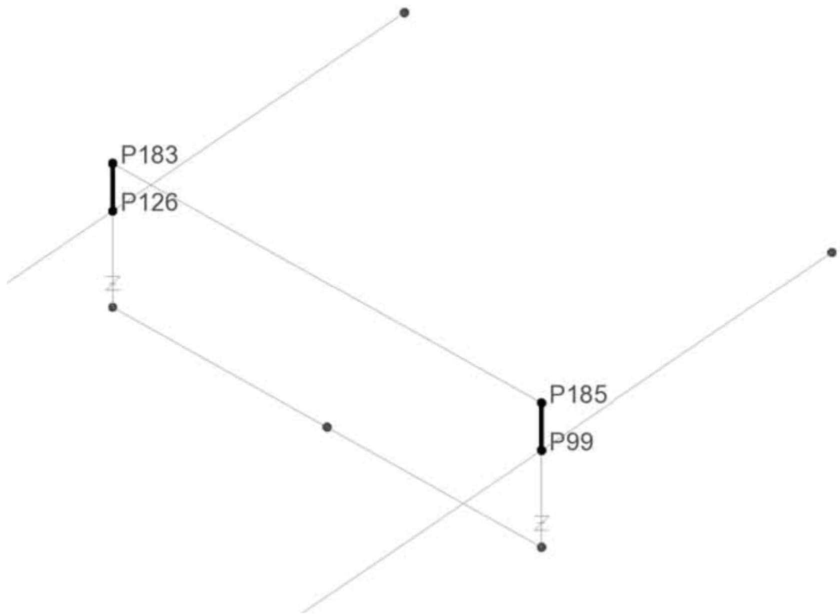
Rigid beam – supportline 3 :



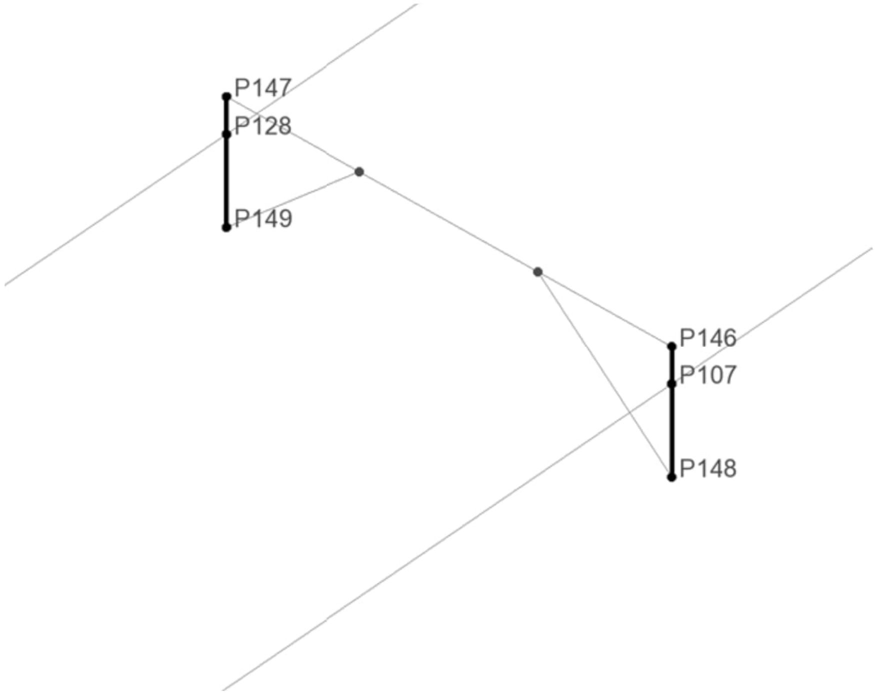
Rigid beam - diaphragm Typ 1:1 :



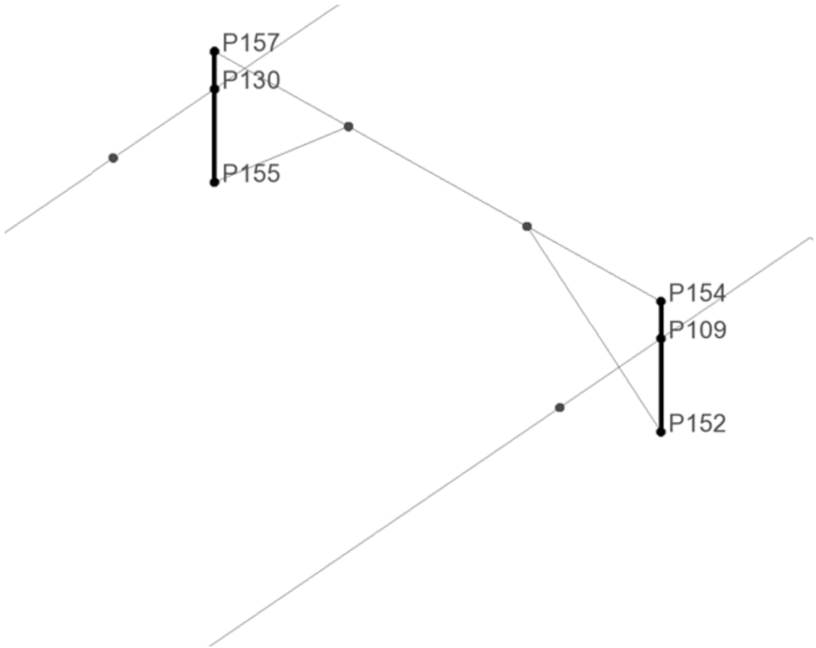
Rigid beam - diaphragm Typ 1:3 :



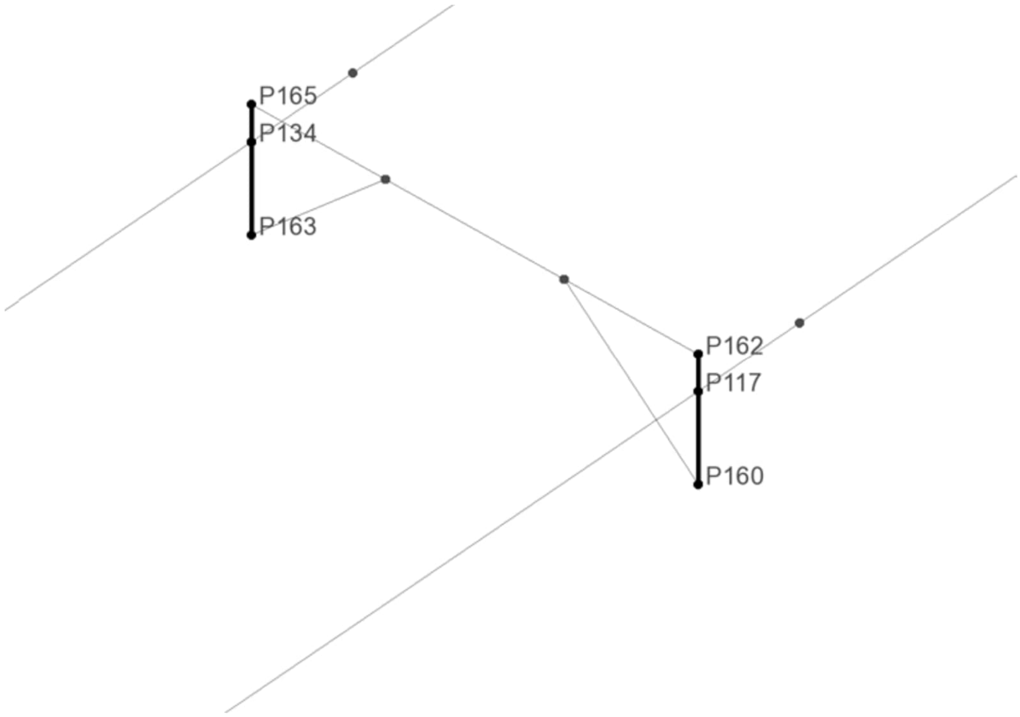
Rigid beam - diaphragm Typ 2:1 :



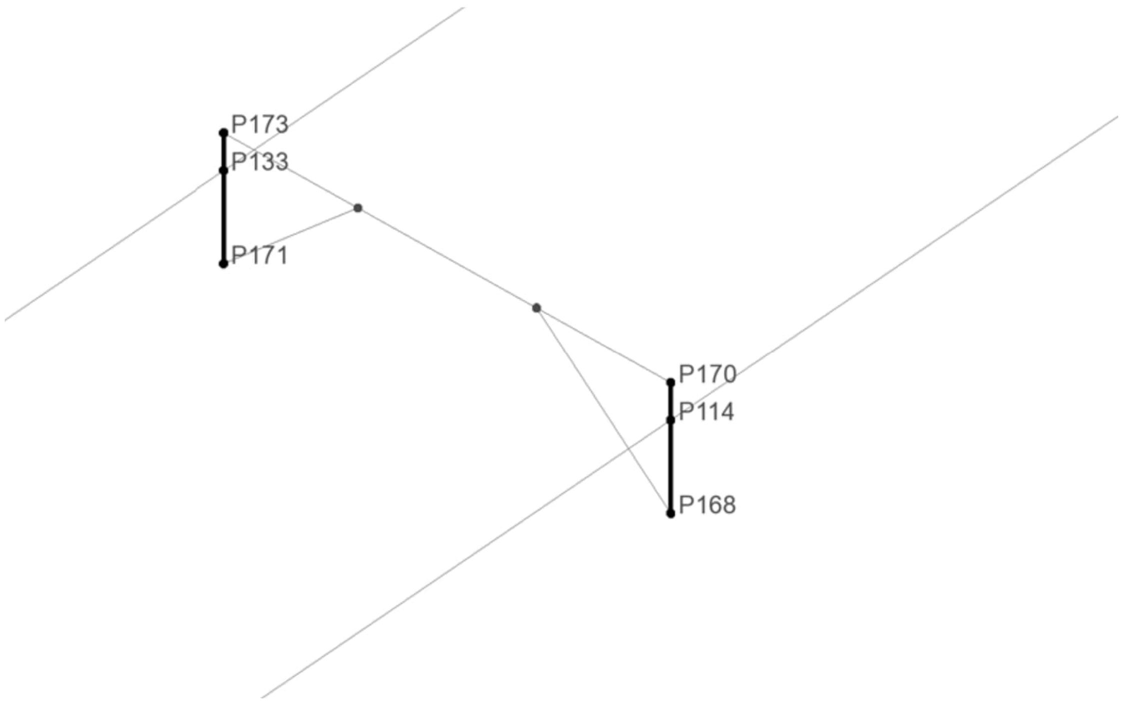
Rigid beam - diaphragm Typ 2:2 :



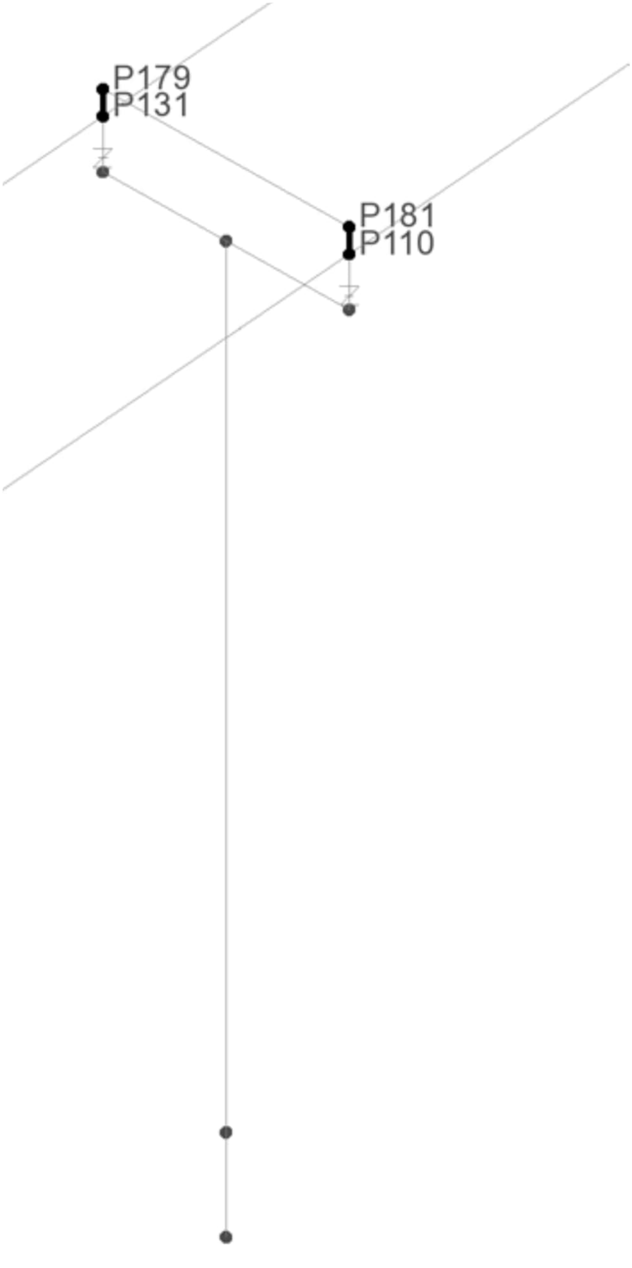
Rigid beam - diaphragm Typ 2:3 :



Rigid beam - diaphragm Typ 2:4 :



Rigid beam - diaphragm Typ 3 :

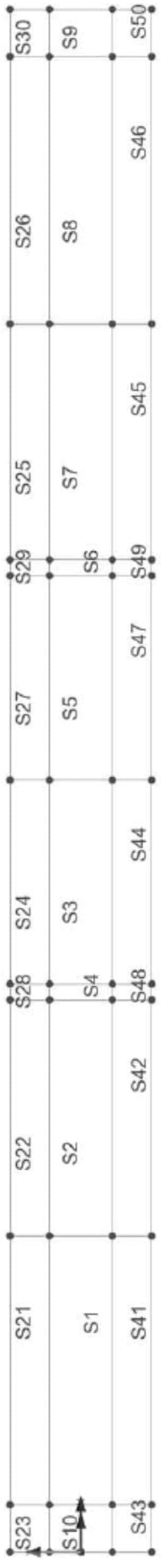


2.2.1.2 Geometri : LINES

Se bilaga 1.

2.2.1.3 Geometri : SURFACES

Deck :



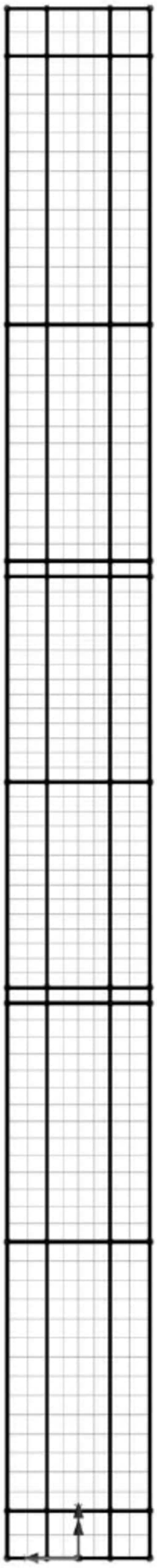
2.2.2 MESH

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 :

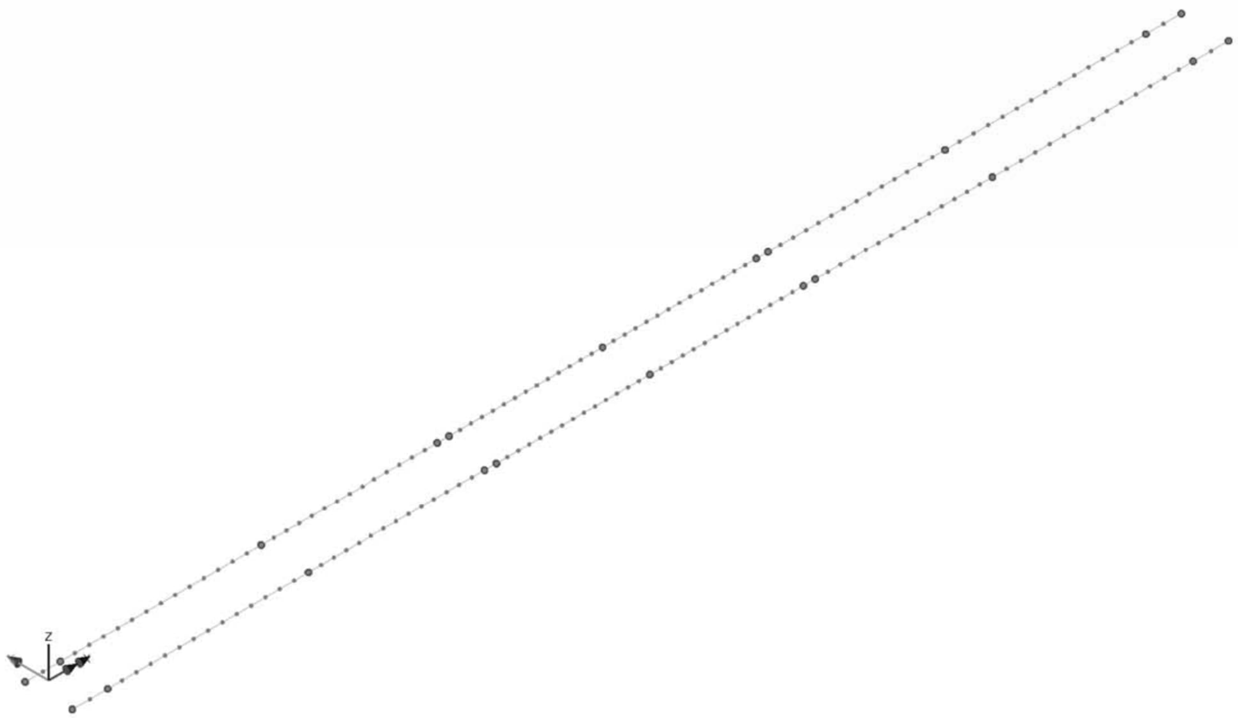


2.2.2.2 MESH : 3D-balkelement

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 :



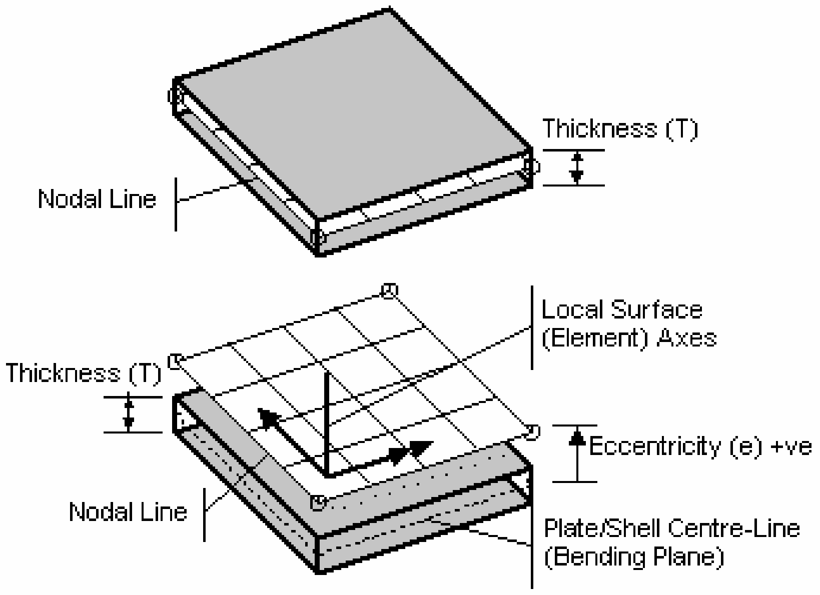
Diaphragm – Typ 1:1, 1:3 och 3 :

Diaphragm – Typ 2:1, 2:2, 2:3 och 2:4 :

2.3 TVÄRSNITTSKONSTANTEER

2.3.1 Farbana

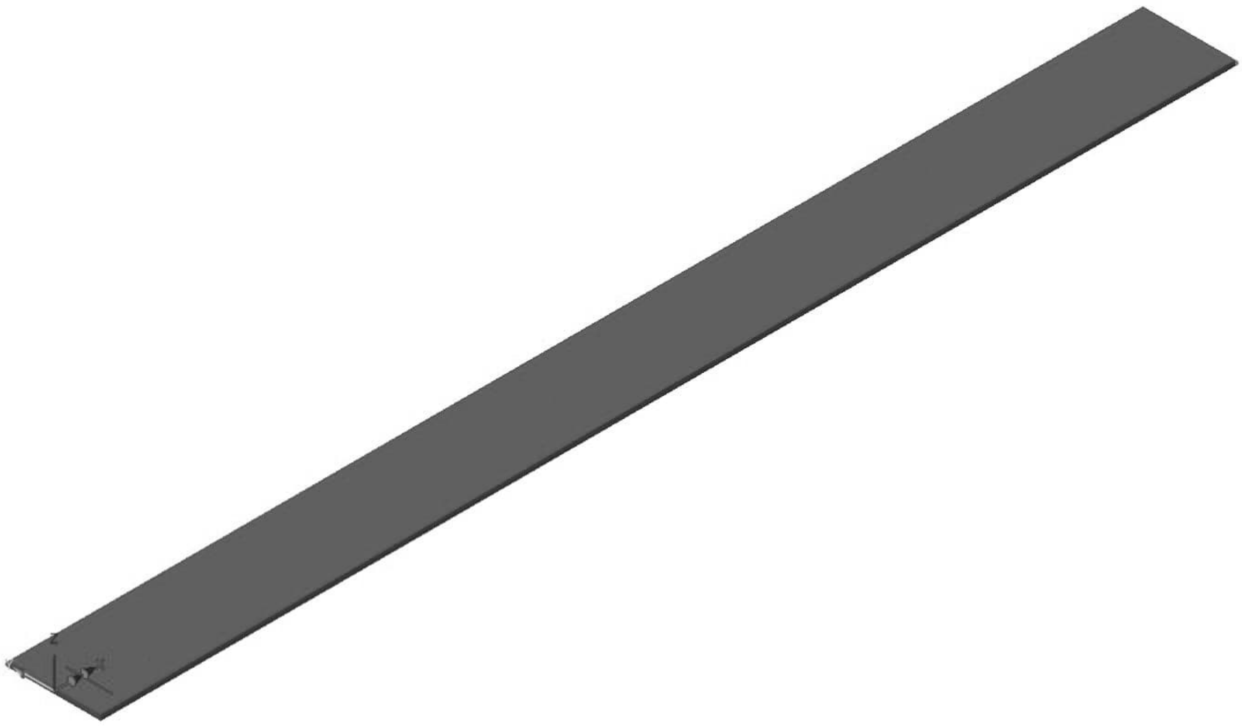
Princip figur av geometrin tillhörande skalelement (”Thick shell” / QTS8) redovisas nedan.



Deck :

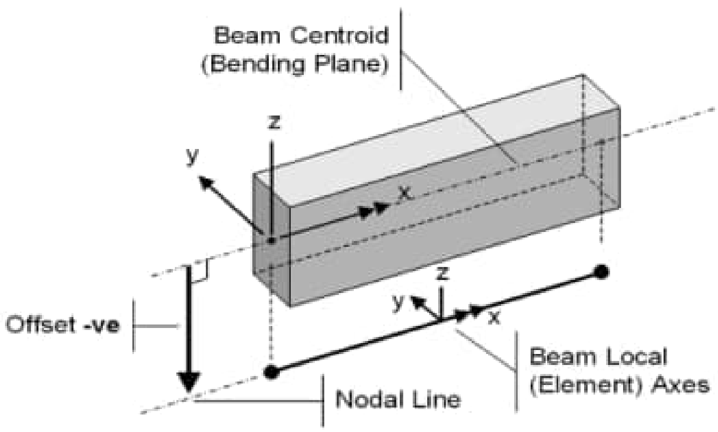
		Value
Thickness	t	0.249
Eccentricity	ez	0.0

Name t = 249 mm (26)

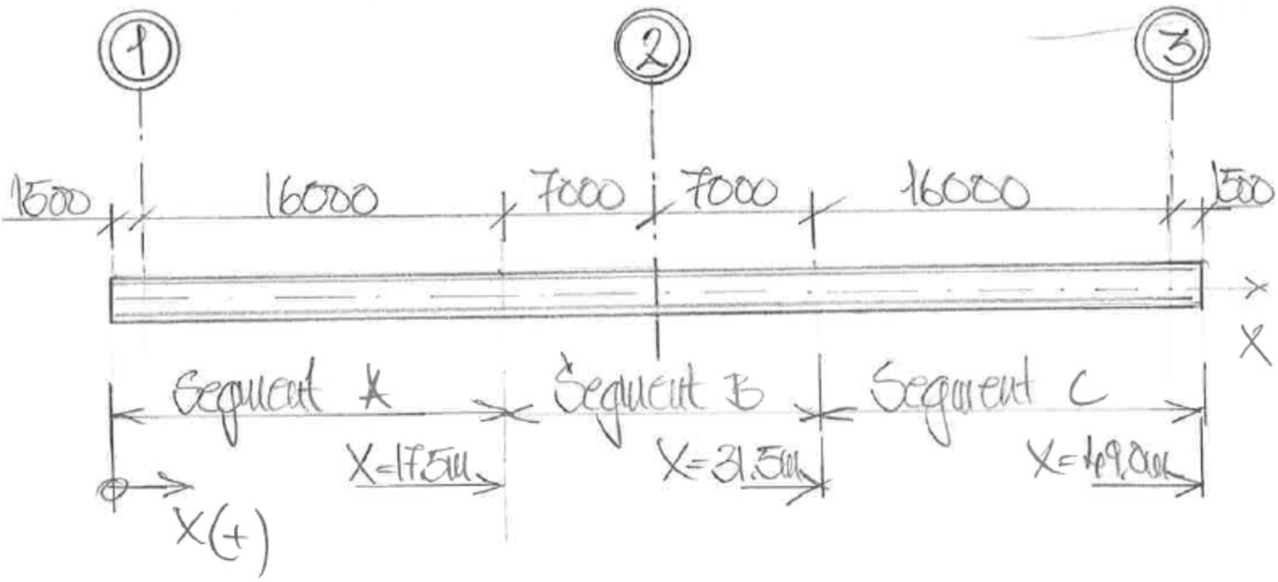


2.3.2 Huvudbalkar (”Thick beam” / BMS3)

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



Stålbalken är utförd med 3 balkar (Segment A, B och C) enligt redovisning nedan.



Tvärsnittskontanter tillhörande huvudbalkarna modelleras med och utan inverkan av betongfarbana beroende på vilken etapp (Stage I-IV) som råder.

Stage I : Byggskede - gjutetapp I
Stage II : Byggskede - gjutetapp II
Stage III : Byggskede - gjutetapp III
Stag IV : Driftskede

Tvärsnittskonstanter för samverkanstvärsnitt uttrycks som ett ekvivalent ståltvärsnitt.

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

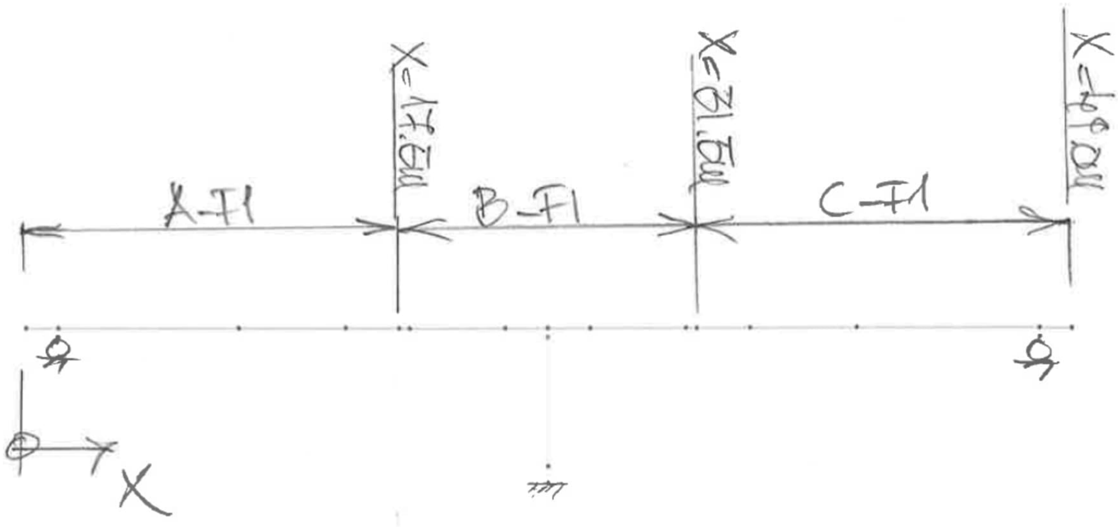
Bestämning av tvärsnittskonstanter är utförd med *Ponti_EC4* dock har en separat oberoende kontroll utförts för att påvisa att erhållna resultat är korrekta.

2.3.2.1 Sammanställning resultat Ponti_EC4

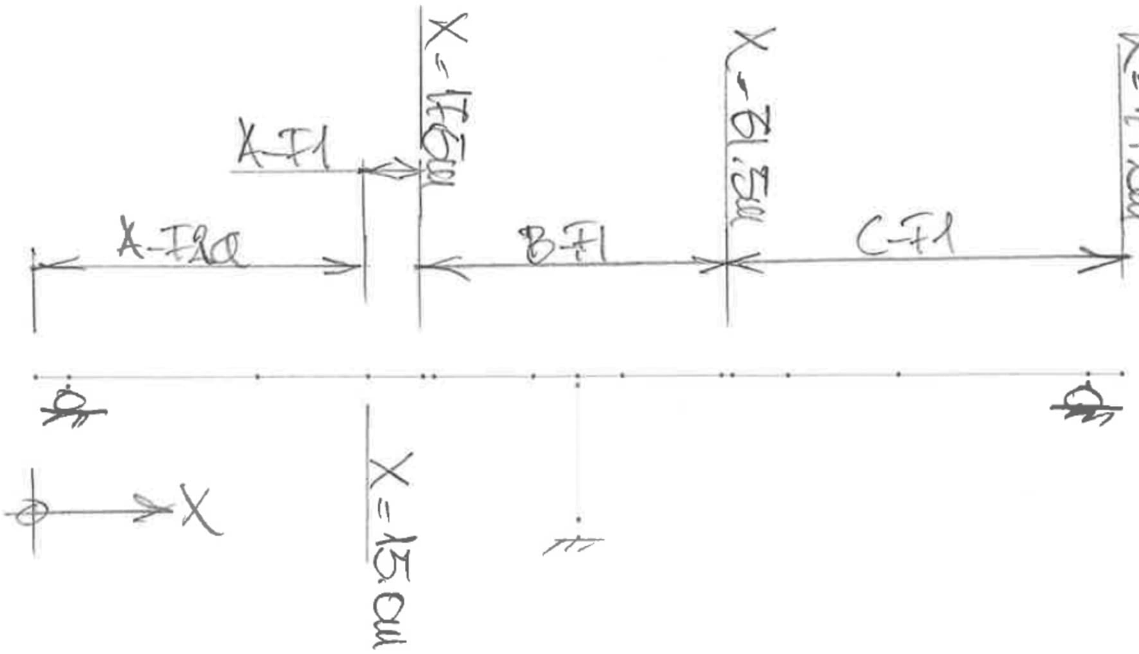
Resultat inklusive inverkan av skjuvdeformationer redovisas för totalt 6 st tvärsnittstyper (Type) enligt redovisning nedan.

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

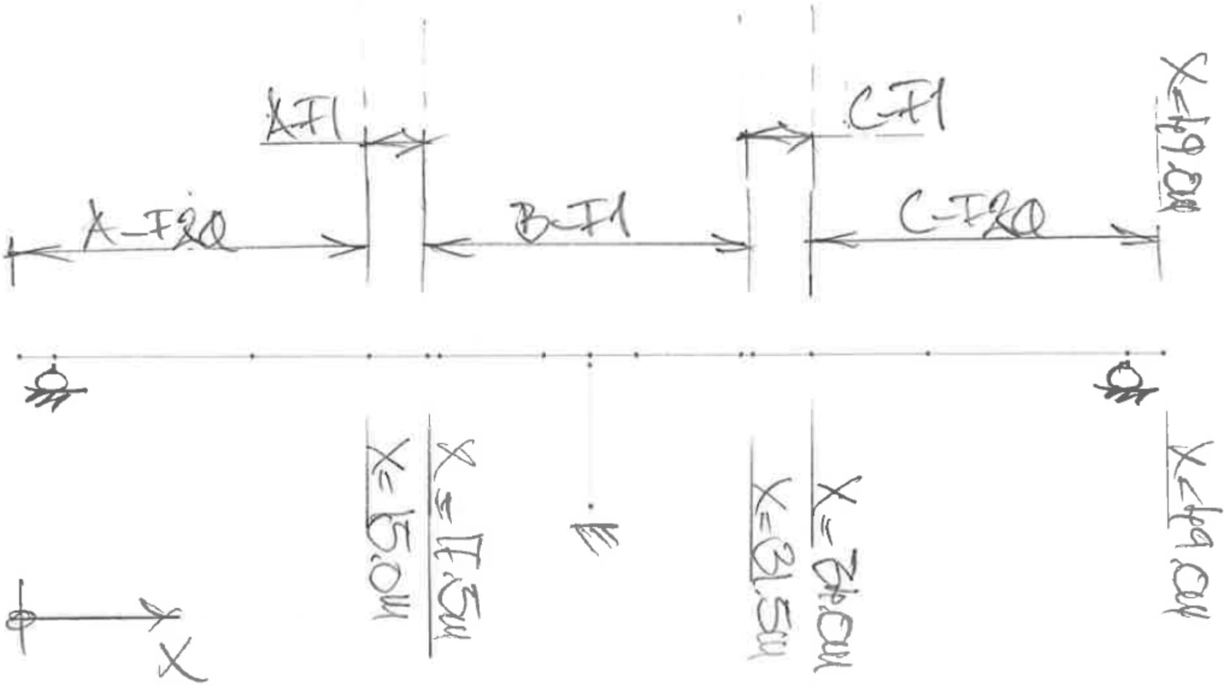
Modular ratios	Värde	Anmärkning
n0	6	Variabla last
nL, perm	20	Permanenta last
nL, sh	13	Krympning
nL, stöd	20	Stödsättning



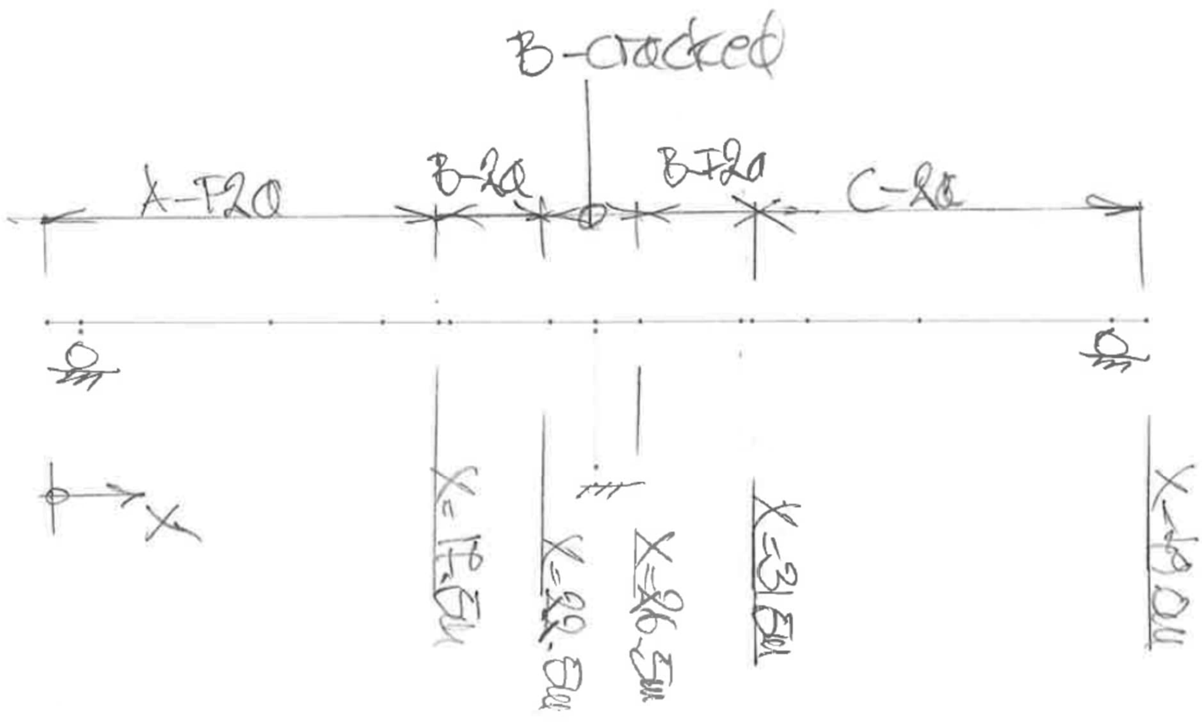
<u>Stage I</u>



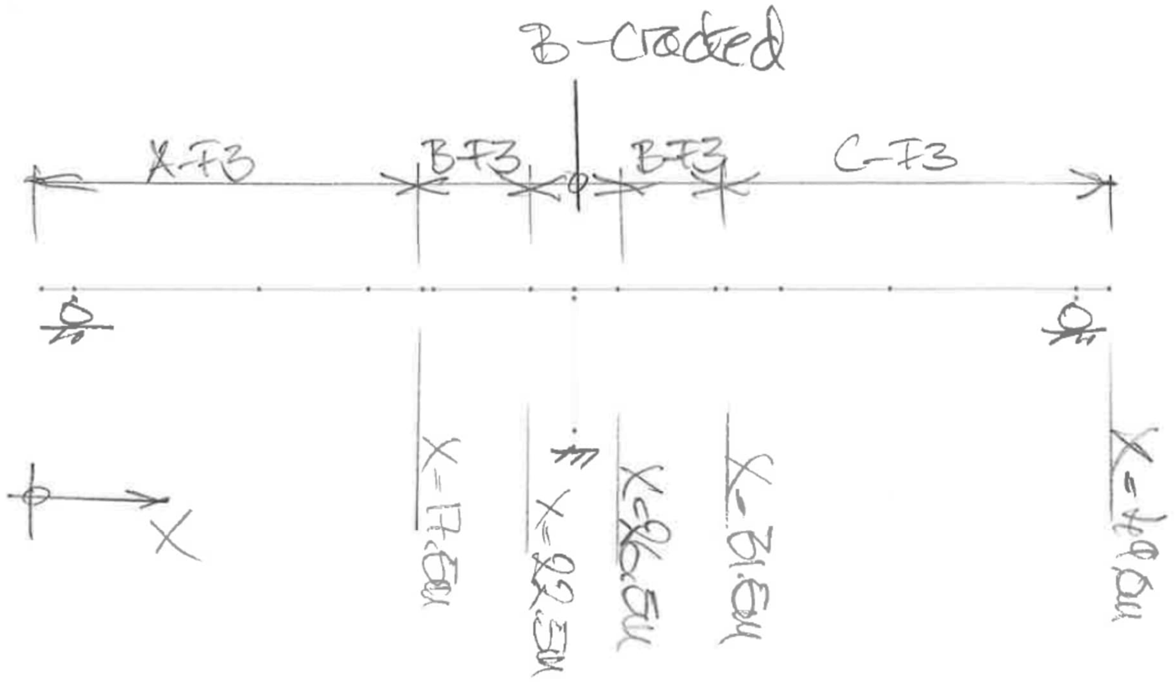
Stage II



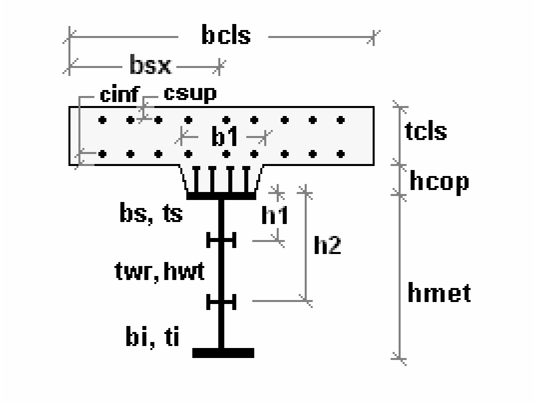
<u>Stage III</u>



<u>Drift-P</u>



Drift-V



Sammanställning indata – stål :

Sections	hs (mm)	btop (mm)	ttop (mm)	hw (mm)	tw (mm)	bbot (mm)	tbot (mm)
A	850	350	20	810	10	500	20
B	850	350	20	805	10	500	25
C	850	350	20	810	10	500	20

Sammanställning indata – betong :

Sections	tconc (mm)	hhaunch (mm)	beff (mm)	Fitop (mm)	pbtop (mm)	ctop (mm)	Fibot (mm)	pbbot (mm)	cbot (mm)
A	249	20	1 950	16	200	50	16	200	50
B	249	20	1 950	16	200	50	16	200	50
C	249	20	1 950	16	200	50	16	200	50

Main properties : Section A

Main data

Steel section height	850 mm
Top flange	350x20 mm
Bottom flange	500x20 mm
Web	10x810 mm, Skew: 0
Slab	1950x249 mm
Haunch	350x16 mm (not considered in the geometric properties calculation)
Top reinforcing bars	diameter 16 mm, bar spacing 200 mm, dist. top slab face-bar centre 50 mm
Bottom reinforcing bars	diameter 16 mm, bar spacing 200 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)	2.51E+4	5.33E+4	6.637E+4	5.33E+4	1.099E+5	2.902E+4
z_G (mm)	375.398	700.827	757.882	700.827	850.076	458.499
J_y (mm^4)	3.31E+9	8.481E+9	9.429E+9	8.481E+9	1.108E+10	4.614E+9
$W_{y,0}$ (mm^3)	-8.816E+6	-1.21E+7	-1.244E+7	-1.21E+7	-1.303E+7	-1.006E+7
$W_{y,1}$ (mm^3)	-9.312E+6	-1.246E+7	-1.278E+7	-1.246E+7	-1.335E+7	-1.052E+7
$W_{y,3}$ (mm^3)	7.28E+6	6.566E+7	1.307E+8	6.566E+7	-5.518E+8	1.242E+7
$W_{y,4}$ (mm^3)	6.973E+6	5.685E+7	1.024E+8	5.685E+7	-1.464E+11	1.179E+7
$W_{y,5}$ (mm^3)	1E+300	5.135E+7	8.721E+7	5.135E+7	6.957E+8	1.132E+7
$W_{y,6}$ (mm^3)	1E+300	3.941E+7	5.964E+7	3.941E+7	1.68E+8	1.009E+7
$W_{y,7}$ (mm^3)	1E+300	2.329E+7	3.07E+7	2.329E+7	5.154E+7	7.608E+6
$W_{y,8}$ (mm^3)	1E+300	2.048E+7	2.64E+7	2.048E+7	4.182E+7	7.029E+6
$S_{y,1}$(mm^3)	3.654E+6	6.908E+6	7.479E+6	6.908E+6	8.401E+6	4.485E+6
$S_{y,2}$(mm^3)	4.286E+6	9.226E+6	1.02E+7	9.226E+6	1.185E+7	5.446E+6
$S_{y,3}$(mm^3)	3.252E+6	9.142E+6	1.018E+7	9.142E+6	1.184E+7	4.756E+6
$S_{y,4}$(mm^3)	-4.657E-10	8.168E+6	9.6E+6	8.168E+6	1.191E+7	2.086E+6
n_E	1E+300	20	13	20	6	1E+300

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

Main properties : Section B

Main data

Steel section height	850 mm
Top flange	350x20 mm
Bottom flange	500x25 mm
Web	10x805 mm, Skew: 0
Slab	1950x249 mm
Haunch	350x16 mm (not considered in the geometric properties calculation)
Top reinforcing bars	diameter 16 mm, bar spacing 200 mm, dist. top slab face-bar centre 50 mm
Bottom reinforcing bars	diameter 16 mm, bar spacing 200 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)	2.755E+4	5.575E+4	6.882E+4	5.575E+4	1.124E+5	3.147E+4
z_G (mm)	344.015	671.016	731.702	671.016	832.036	424.556
J_y (mm^4)	3.587E+9	9.559E+9	1.071E+10	9.559E+9	1.272E+10	5.044E+9
$W_{y,0}$ (mm^3)	-1.043E+7	-1.425E+7	-1.463E+7	-1.425E+7	-1.529E+7	-1.188E+7
$W_{y,1}$ (mm^3)	-1.125E+7	-1.48E+7	-1.515E+7	-1.48E+7	-1.576E+7	-1.262E+7
$W_{y,3}$ (mm^3)	7.382E+6	6.012E+7	1.089E+8	6.012E+7	-6.247E+9	1.244E+7
$W_{y,4}$ (mm^3)	7.09E+6	5.341E+7	9.051E+7	5.341E+7	7.081E+8	1.186E+7
$W_{y,5}$ (mm^3)	1E+300	4.902E+7	7.973E+7	4.902E+7	3.745E+8	1.143E+7
$W_{y,6}$ (mm^3)	1E+300	3.902E+7	5.81E+7	3.902E+7	1.515E+8	1.026E+7
$W_{y,7}$ (mm^3)	1E+300	2.426E+7	3.212E+7	2.426E+7	5.46E+7	7.875E+6
$W_{y,8}$ (mm^3)	1E+300	2.153E+7	2.793E+7	2.153E+7	4.495E+7	7.305E+6
$S_{y,1}$(mm^3)	4.144E+6	8.231E+6	8.99E+6	8.231E+6	1.024E+7	5.151E+6
$S_{y,2}$(mm^3)	4.653E+6	1.032E+7	1.149E+7	1.032E+7	1.35E+7	5.949E+6
$S_{y,3}$(mm^3)	3.472E+6	1.019E+7	1.144E+7	1.019E+7	1.35E+7	5.127E+6
$S_{y,4}$(mm^3)	9.313E-10	9.009E+6	1.068E+7	9.009E+6	1.344E+7	2.219E+6
n_E	1E+300	20	13	20	6	1E+300

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

Main properties : Section C

Main data

Steel section height	850 mm
Top flange	350x20 mm
Bottom flange	500x20 mm
Web	10x810 mm, Skew: 0
Slab	1950x249 mm
Haunch	350x16 mm (not considered in the geometric properties calculation)
Top reinforcing bars	diameter 16 mm, bar spacing 200 mm, dist. top slab face-bar centre 50 mm
Bottom reinforcing bars	diameter 16 mm, bar spacing 200 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)	2.51E+4	5.33E+4	6.637E+4	5.33E+4	1.099E+5	2.902E+4
z_G (mm)	375.398	700.827	757.882	700.827	850.076	458.499
J_y (mm^4)	3.31E+9	8.481E+9	9.429E+9	8.481E+9	1.108E+10	4.614E+9
$W_{y,0}$ (mm^3)	-8.816E+6	-1.21E+7	-1.244E+7	-1.21E+7	-1.303E+7	-1.006E+7
$W_{y,1}$ (mm^3)	-9.312E+6	-1.246E+7	-1.278E+7	-1.246E+7	-1.335E+7	-1.052E+7
$W_{y,3}$ (mm^3)	7.28E+6	6.566E+7	1.307E+8	6.566E+7	-5.518E+8	1.242E+7
$W_{y,4}$ (mm^3)	6.973E+6	5.685E+7	1.024E+8	5.685E+7	-1.464E+11	1.179E+7
$W_{y,5}$ (mm^3)	1E+300	5.135E+7	8.721E+7	5.135E+7	6.957E+8	1.132E+7
$W_{y,6}$ (mm^3)	1E+300	3.941E+7	5.964E+7	3.941E+7	1.68E+8	1.009E+7
$W_{y,7}$ (mm^3)	1E+300	2.329E+7	3.07E+7	2.329E+7	5.154E+7	7.608E+6
$W_{y,8}$ (mm^3)	1E+300	2.048E+7	2.64E+7	2.048E+7	4.182E+7	7.029E+6
$S_{y,1}$(mm^3)	3.654E+6	6.908E+6	7.479E+6	6.908E+6	8.401E+6	4.485E+6
$S_{y,2}$(mm^3)	4.286E+6	9.226E+6	1.02E+7	9.226E+6	1.185E+7	5.446E+6
$S_{y,3}$(mm^3)	3.252E+6	9.142E+6	1.018E+7	9.142E+6	1.184E+7	4.756E+6
$S_{y,4}$(mm^3)	-4.657E-10	8.168E+6	9.6E+6	8.168E+6	1.191E+7	2.086E+6
n_E	1E+300	20	13	20	6	1E+300

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

2.3.2.2 Inverkan av skjuvdeformationer

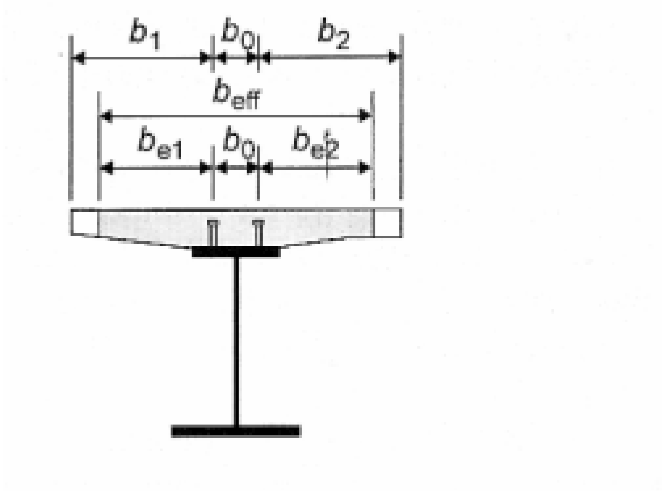
Inverkan av skjuvdeformationer beaktas genom att bestämma medverkande flänsbredd enligt EC4 avsnitt 5.4.1.2 med beräkningsprogram PROG T031.

Anm Beräkningen är utförd för att kunna påvisa att resultatet enligt Point_EC4 är korrekt utförd.

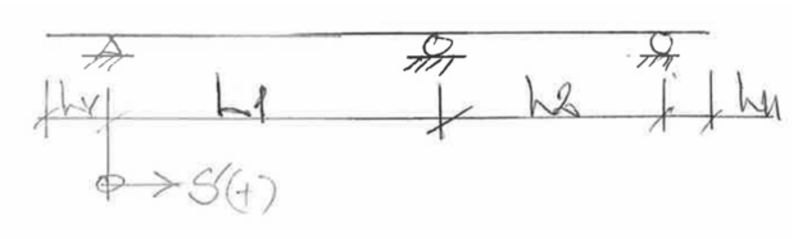
Objekt: Samverkansbro

PRINCIPFIGUR

Tvärsnitt



Systemskiss



INDATA

Konsollängder

$L_v = 1.5m$

$L_h = 1.5m$

Spännvidd

$L_1 = 23m$

$L_2 = 23m$

Bredder tillhörande bruttotvärsnitt

Tyngdpunkt och höjd för samverkanstvärsnitt :

Spann	s'	b_0	b_1	b_2
1	0	400	750	800
1	5.75	400	750	800
1	8.50	400	750	800
1	16.50	400	750	800
1	17.25	400	750	800
1	23.00	400	750	800
-	m	mm	mm	mm

BERÄKNING

Antalet studerade snitt

$N_{Snitt} = \text{rows}(\text{Spann}) = 6$

$N_{Snitt} = 6 \cdot st$

Medverkande flänsbredd enligt EC4 avsnitt 5.4.1.2

Funktion för medverkande fläns :

$$b'_e = \left| \begin{array}{l} \text{if } L_v \neq 0m \wedge L_h \neq 0m \wedge 0s' \leq (L_v + L_1) \\ \quad \left| \begin{array}{l} L_{e1} \leftarrow 2L_v \\ L_{e2} \leftarrow 0.70L_1 \\ L_{e3} \leftarrow 0.25 \cdot (L_1 + L_2) \\ b_{e1} \leftarrow \dfrac{L_{e1}}{8} \\ b_{e2} \leftarrow \dfrac{L_{e2}}{8} \\ b_{e3} \leftarrow \dfrac{L_{e3}}{8} \end{array} \right. \\ \text{linterp}\left[\begin{pmatrix} 0 & 0.25L_1 & 0.75L_1 & L_1 \end{pmatrix}^T, \begin{pmatrix} b_{e1} & b_{e2} & b_{e2} & b_{e3} \end{pmatrix}^T, s' \right] \end{array} \right.$$

Vänster sida :

$b_{e1} = \min(b'_e, b_1)$

Höger sida :

$b_{e2} = \min(b'_e, b_2)$

Total bredd :

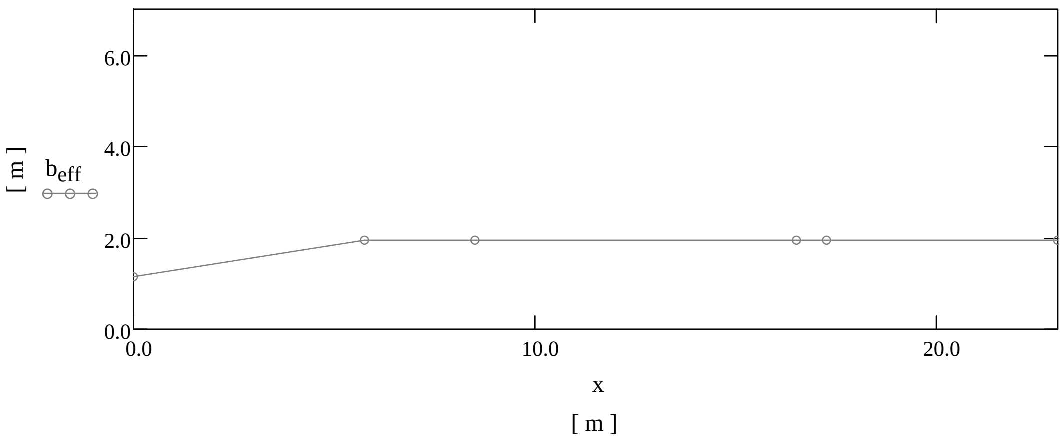
$b_{eff} = b_{e1} + b_0 + b_{e2}$

RESULTAT

Tabell

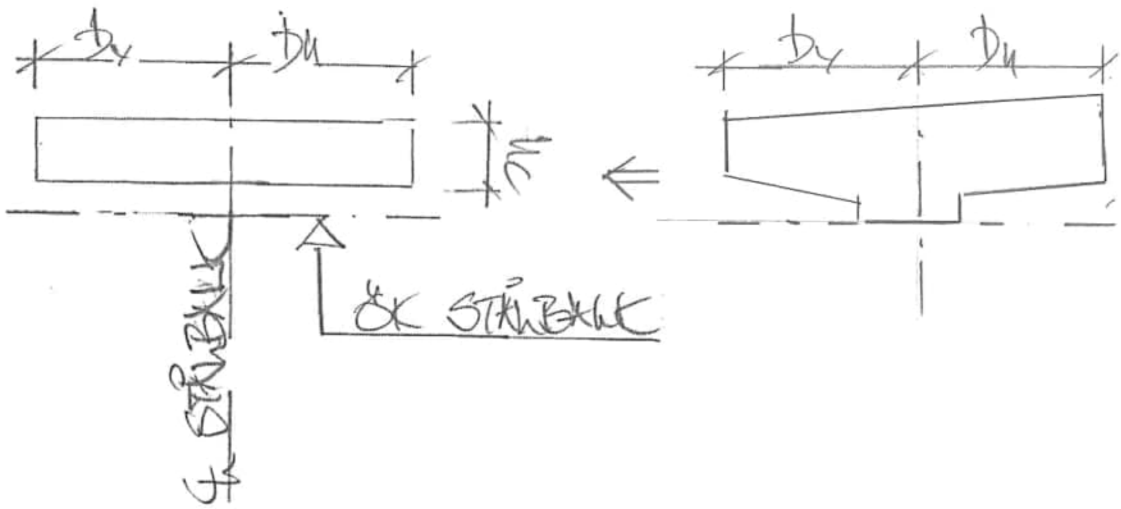
Spann	s'	b_{e1}	b_{e2}	b_{eff}
1	0	375	375	1150
1	5.75	750	800	1950
1	8.50	750	800	1950
1	16.50	750	800	1950
1	17.25	750	800	1950
1	23.00	750	800	1950
-	m	mm	mm	mm

Grafisk kvittens



2.3.2.3 Ekvivalent betongfarbana

Vid bestämning av tvärsnittskonstanter för samverkanstvärsnitt tillämpas en ekvivalent betongfarbana enligt principfigur nedan. Utvärdering sker med beräkningsprogram PROG T030.



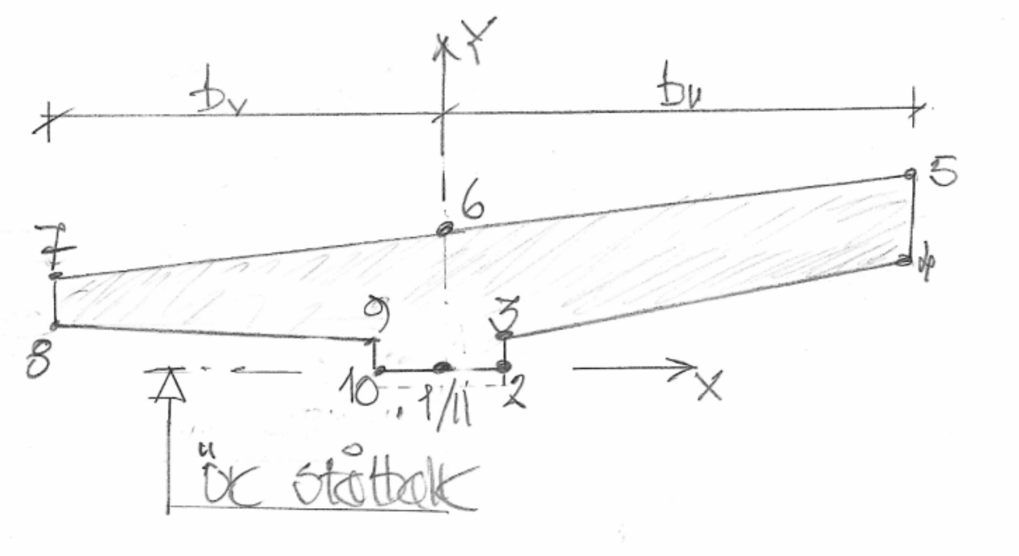
Ekvivalent tvärsnitt

Verkligt tvärsnitt

Objekt: Farbana

PRINCIPFIGUR

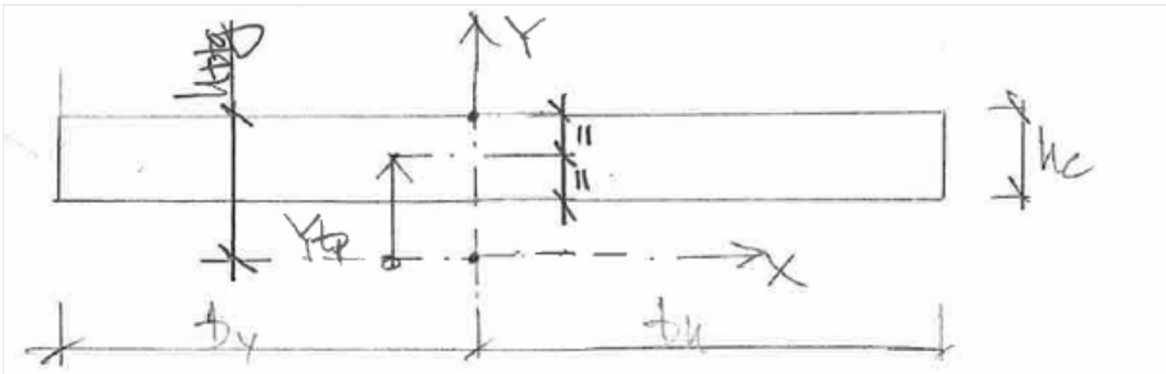
Verkligt tvärsnitt :



Antalet hörn : $n_p = 10st$

Antalet punkter (= n_p+1 ty 1:a och sista punkt skall sammanfalla) :
$N_p = n_p + 1 = 11 \cdot st$

Ekvivalent tvärsnitt :



INDATA

Ange antalet snitt som studeras : $N_s := 2st$

Koordinater (punkter skall anges "moturs") :

	Enhet	Snitt 1	Snitt 2
x_{P1}	[m]	0	0
y_{P1}	[m]	0	0
x_{P2}	[m]	0.200	0.200
y_{P2}	[m]	0	0
x_{P3}	[m]	0.200	0.200
y_{P3}	[m]	0.020	0.020
x_{P4}	[m]	1.000	1.000
y_{P4}	[m]	0.020	0.020
x_{P5}	[m]	1.000	1.000
y_{P5}	[m]	0.270	0.270
x_{P6}	[m]	0	0
y_{P6}	[m]	0.265	0.265
x_{P7}	[m]	-0.950	-0.950
y_{P7}	[m]	0.260	0.260
x_{P8}	[m]	-0.950	-0.950
y_{P8}	[m]	0.020	0.020
x_{P9}	[m]	-0.200	-0.200
y_{P9}	[m]	0.020	0.020
x_{P10}	[m]	-0.200	-0.200
y_{P10}	[m]	0	0
x_{P11}	[m]	0	0
y_{P11}	[m]	0	0

BERÄKNING

Area :

$$A = \left| \begin{array}{l} \text{for } j \in 1..N_s \\ \quad \left| \begin{array}{l} x \leftarrow \left(xp1_j \ \ xp2_j \ \ xp3_j \ \ xp4_j \ \ xp5_j \ \ xp6_j \ \ xp7_j \ \ xp8_j \ \ xp9_j \ \ xp10_j \ \ xp11_j \right) \\ y \leftarrow \left(yp1_j \ \ yp2_j \ \ yp3_j \ \ yp4_j \ \ yp5_j \ \ yp6_j \ \ yp7_j \ \ yp8_j \ \ yp9_j \ \ yp10_j \ \ yp11_j \right) \\ \displaystyle\sum_{i=1}^{n_p} \frac{\left[\left(y_{i+1} - y_i\right)\cdot\left(x_{i+1} + x_i\right)\right]}{2} \end{array} \right. \end{array} \right.$$

Statiskt moment Sx :

$$S_x = \left| \begin{array}{l} \text{for } j \in 1..N_s \\ \quad \left| \begin{array}{l} x \leftarrow \left(xp1_j \ \ xp2_j \ \ xp3_j \ \ xp4_j \ \ xp5_j \ \ xp6_j \ \ xp7_j \ \ xp8_j \ \ xp9_j \ \ xp10_j \ \ xp11_j \right) \\ y \leftarrow \left(yp1_j \ \ yp2_j \ \ yp3_j \ \ yp4_j \ \ yp5_j \ \ yp6_j \ \ yp7_j \ \ yp8_j \ \ yp9_j \ \ yp10_j \ \ yp11_j \right) \\ \displaystyle\sum_{i=1}^{n_p} \left[\left(y_{i+1} - y_i\right)\cdot\left[\frac{\left(x_{i+1} - x_i\right)\cdot\left(y_{i+1} - y_i\right)}{3} + \frac{\left[y_i\cdot\left(x_{i+1} - x_i\right)\right] + \left[x_i\cdot\left(y_{i+1} - y_i\right)\right] + 2\cdot x_i\cdot y_i}{2}\right]\right] \end{array} \right. \end{array} \right.$$

Statiskt moment Sy:

$$S_y = \left| \begin{array}{l} \text{for } j \in 1..N_s \\ \quad \left| \begin{array}{l} x \leftarrow \left(xp1_j \ \ xp2_j \ \ xp3_j \ \ xp4_j \ \ xp5_j \ \ xp6_j \ \ xp7_j \ \ xp8_j \ \ xp9_j \ \ xp10_j \ \ xp11_j \right) \\ y \leftarrow \left(yp1_j \ \ yp2_j \ \ yp3_j \ \ yp4_j \ \ yp5_j \ \ yp6_j \ \ yp7_j \ \ yp8_j \ \ yp9_j \ \ yp10_j \ \ yp11_j \right) \\ \displaystyle\sum_{i=1}^{n_p} \left[\left(\frac{y_{i+1} - y_i}{2}\right)\cdot\left[\frac{\left(x_{i+1} - x_i\right)^2}{3} + x_i\cdot x_{i+1}\right]\right] \end{array} \right. \end{array} \right.$$

Tyngdpunktslägen:

$$x_{tp} = \frac{S_y}{A}$$

$$y_{tp} = \frac{S_x}{A}$$

Funktion - tröghetsmoment :

$$fIx(x,y) = \sum_{i=1}^{n_p} \left[(y_{i+1} - y_i) \cdot \left[\frac{(x_{i+1} - x_i)}{4} \cdot (y_{i+1} - y_i)^2 + 2 \cdot \frac{y_i}{3} \cdot (x_{i+1} - x_i) \cdot (y_{i+1} - y_i) + (x_{i+1} - x_i) \cdot \left[\frac{(y_i)^2}{2} \right] \ldots \atop + x_i \cdot \left[\left[\frac{(y_{i+1} - y_i)^2}{3} \right] + y_{i+1} \cdot y_i \right] \right] \right]$$

$$fIy(x,y) = \sum_{i=1}^{n_p} \left[\left[\frac{(y_{i+1} - y_i)}{3} \right] \cdot \left[\frac{(x_{i+1} - x_i)^3}{4} + x_i \cdot (x_{i+1} - x_i)^2 + 1.5 \cdot (x_i)^2 \cdot (x_{i+1} - x_i) + (x_i)^3 \right] \right]$$

Tröghetsmoment map origo :

$$I_x = \left| \begin{array}{l} \text{for } j \in 1 .. N_s \\ \quad \left| \begin{array}{l} x \leftarrow \left(xp1_j \;\; xp2_j \;\; xp3_j \;\; xp4_j \;\; xp5_j \;\; xp6_j \;\; xp7_j \;\; xp8_j \;\; xp9_j \;\; xp10_j \;\; xp11_j \right) \\ y \leftarrow \left(yp1_j \;\; yp2_j \;\; yp3_j \;\; yp4_j \;\; yp5_j \;\; yp6_j \;\; yp7_j \;\; yp8_j \;\; yp9_j \;\; yp10_j \;\; yp11_j \right) \\ fIx(x,y) \end{array} \right. \end{array} \right.$$

$$I_y = \left| \begin{array}{l} \text{for } j \in 1 .. N_s \\ \quad \left| \begin{array}{l} x \leftarrow \left(xp1_j \;\; xp2_j \;\; xp3_j \;\; xp4_j \;\; xp5_j \;\; xp6_j \;\; xp7_j \;\; xp8_j \;\; xp9_j \;\; xp10_j \;\; xp11_j \right) \\ y \leftarrow \left(yp1_j \;\; yp2_j \;\; yp3_j \;\; yp4_j \;\; yp5_j \;\; yp6_j \;\; yp7_j \;\; yp8_j \;\; yp9_j \;\; yp10_j \;\; yp11_j \right) \\ fIy(x,y) \end{array} \right. \end{array} \right.$$

Tröghetsmoment map TP:

$$I_{x.tp} = \left| \begin{array}{l} \text{for } j \in 1..N_s \\ \quad \left| \begin{array}{l} x \leftarrow \left(xP1_j \ \ xP2_j \ \ xP3_j \ \ xP4_j \ \ xP5_j \ \ xP6_j \ \ xP7_j \ \ xP8_j \ \ xP9_j \ \ xP10_j \ \ xP11_j \right) \\ y \leftarrow \left(yP1_j \ \ yP2_j \ \ yP3_j \ \ yP4_j \ \ yP5_j \ \ yP6_j \ \ yP7_j \ \ yP8_j \ \ yP9_j \ \ yP10_j \ \ yP11_j \right) \\ x0 \leftarrow x - x_{tp_j} \\ y0 \leftarrow y - y_{tp_j} \\ fIx(x0, y0) \end{array} \right. \end{array} \right.$$

$$I_{y.tp} = \left| \begin{array}{l} \text{for } j \in 1..N_s \\ \quad \left| \begin{array}{l} x \leftarrow \left(xP1_j \ \ xP2_j \ \ xP3_j \ \ xP4_j \ \ xP5_j \ \ xP6_j \ \ xP7_j \ \ xP8_j \ \ xP9_j \ \ xP10_j \ \ xP11_j \right) \\ y \leftarrow \left(yP1_j \ \ yP2_j \ \ yP3_j \ \ yP4_j \ \ yP5_j \ \ yP6_j \ \ yP7_j \ \ yP8_j \ \ yP9_j \ \ yP10_j \ \ yP11_j \right) \\ x0 \leftarrow x - x_{tp_j} \\ y0 \leftarrow y - y_{tp_j} \\ fIy(x0, y0) \end{array} \right. \end{array} \right.$$

Ekvivalent bredd

$$b_v := \left| \begin{array}{l} \text{for } j \in 1..N_s \\ \quad \left| \begin{array}{l} x \leftarrow \left(xP1_j \ \ xP2_j \ \ xP3_j \ \ xP4_j \ \ xP5_j \ \ xP6_j \ \ xP7_j \ \ xP8_j \ \ xP9_j \ \ xP10_j \ \ xP11_j \right) \\ -\min(x) \end{array} \right. \end{array} \right.$$

$$b_h := \left| \begin{array}{l} \text{for } j \in 1..N_s \\ \quad \left| \begin{array}{l} x \leftarrow \left(xP1_j \ \ xP2_j \ \ xP3_j \ \ xP4_j \ \ xP5_j \ \ xP6_j \ \ xP7_j \ \ xP8_j \ \ xP9_j \ \ xP10_j \ \ xP11_j \right) \\ \max(x) \end{array} \right. \end{array} \right.$$

Ekvivalent höjd

$$h_c := \frac{A}{b_v + b_h} \qquad h_{btg} := y_{tp} + 0.5 h_c$$

RESULTAT

Area :

$A^T = \begin{pmatrix} 0.486 & 0.486 \end{pmatrix} m^2$

Tvärsnittskonstanter kring x-x axel :

$S_x{}^T = \begin{pmatrix} 0.068 & 0.068 \end{pmatrix} m^3$

$10^3 I_x{}^T = \begin{pmatrix} 12.105 & 12.105 \end{pmatrix} m^4$

Tvärsnittskonstanter kring y-y axel :

$S_y{}^T = \begin{pmatrix} 0.015 & 0.015 \end{pmatrix} m^3$

$I_y{}^T = \begin{pmatrix} 0.152 & 0.152 \end{pmatrix} m^4$

Koordinat tyngdpunkt :

$x_{tp}{}^T = \begin{pmatrix} 0.031 & 0.031 \end{pmatrix} m$

$y_{tp}{}^T = \begin{pmatrix} 0.140 & 0.140 \end{pmatrix} m$

Tröghetsmoment kring tyngdpunktslägen :

$10^3 I_{x.tp}{}^T = \begin{pmatrix} 2.532 & 2.532 \end{pmatrix} m^4$

$I_{y.tp}{}^T = \begin{pmatrix} 0.152 & 0.152 \end{pmatrix} m^4$

Ekivalent tvärsnitt :

$b_v{}^T = \begin{pmatrix} 0.950 & 0.950 \end{pmatrix} m$

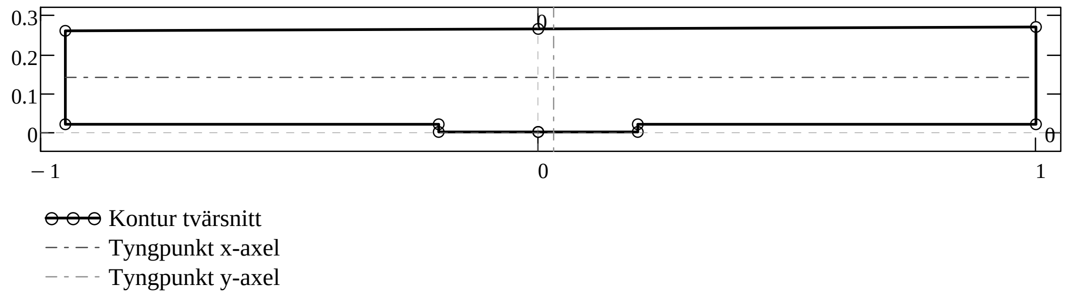
$b_h{}^T = \begin{pmatrix} 1.000 & 1.000 \end{pmatrix} m$

$h_c{}^T = \begin{pmatrix} 249 & 249 \end{pmatrix} \cdot mm$

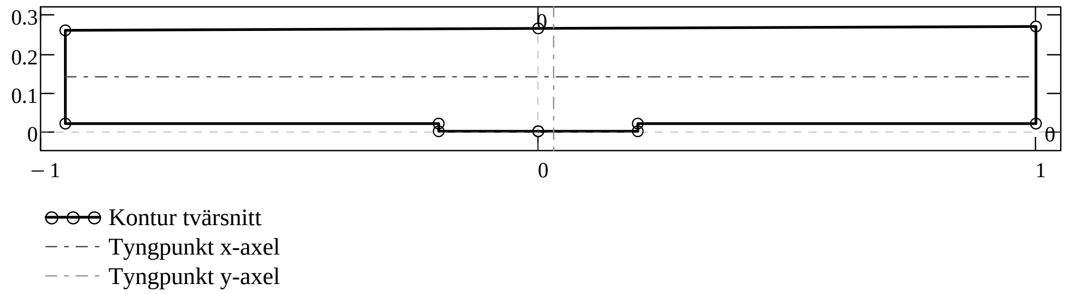
$h_{btg}{}^T = \begin{pmatrix} 265 & 265 \end{pmatrix} \cdot mm$

Grafisk redovisning :

Snitt $j := 1$:



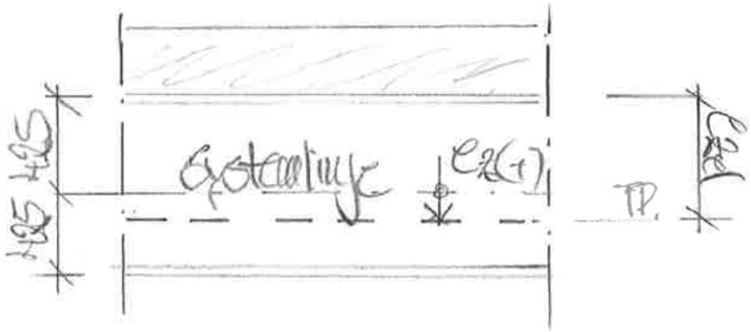
Snitt $j := 2$:



2.3.2.4 Tvärsnittskonstanter samverkanstvärsnitt

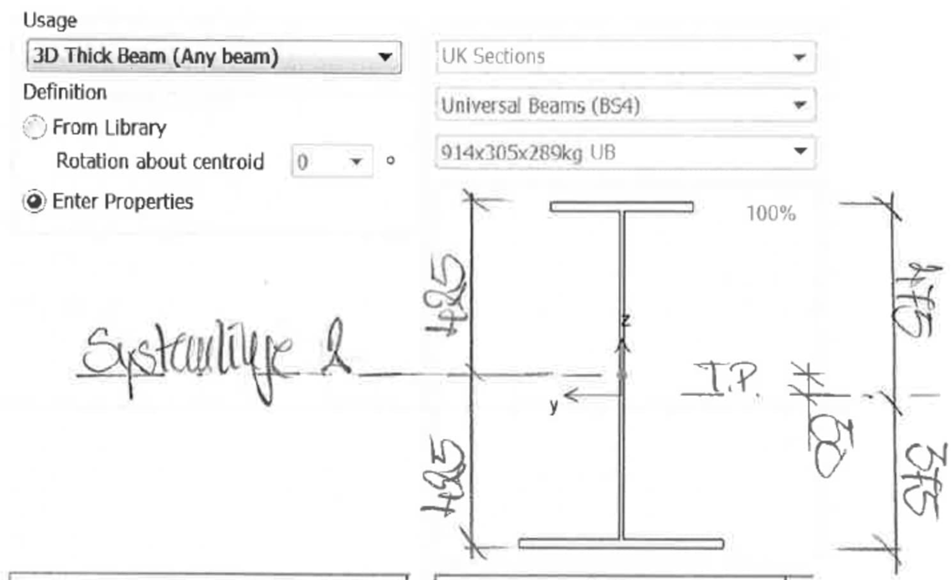
Tvärsnittskonstanter tillhörande samverkans tvärsnitt bestäms med beräkningsprogram Point_EC4.

För att påvisa rimligheten används PROG T030.



2.3.2.4.1 Main girder - Segment A (C)

Segment A – Phase 1 (ståltvärsnitt) :



	Value
Cross sectional area (A)	0.0251
Second moment of area about y axis (Iyy)	3.30951E-3
Second moment of area about z axis (Izz)	0.279859E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	2.53667E-6
Effective shear area in y direction (Asy)	0.017
Effective shear area in z direction (Asz)	8.1E-3
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.05

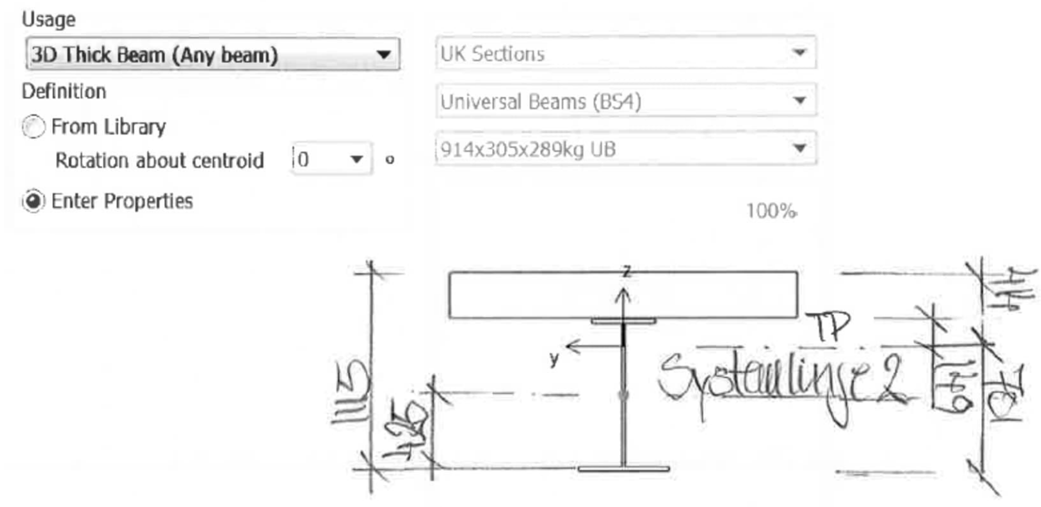
Visualise... Tapering >> Section details...

Name A1__F1 (1)

$$e_z = e_{zel} - 0.425m = 0.475m - 0.425m = 0.050m$$

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) :



	Value
Cross sectional area (A)	0.0532982
Second moment of area about y axis (Iyy)	8.48101E-3
Second moment of area about z axis (Izz)	7.97279E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	0.253408E-3
Effective shear area in y direction (Asy)	0.017
Effective shear area in z direction (Asz)	8.1E-3
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.276

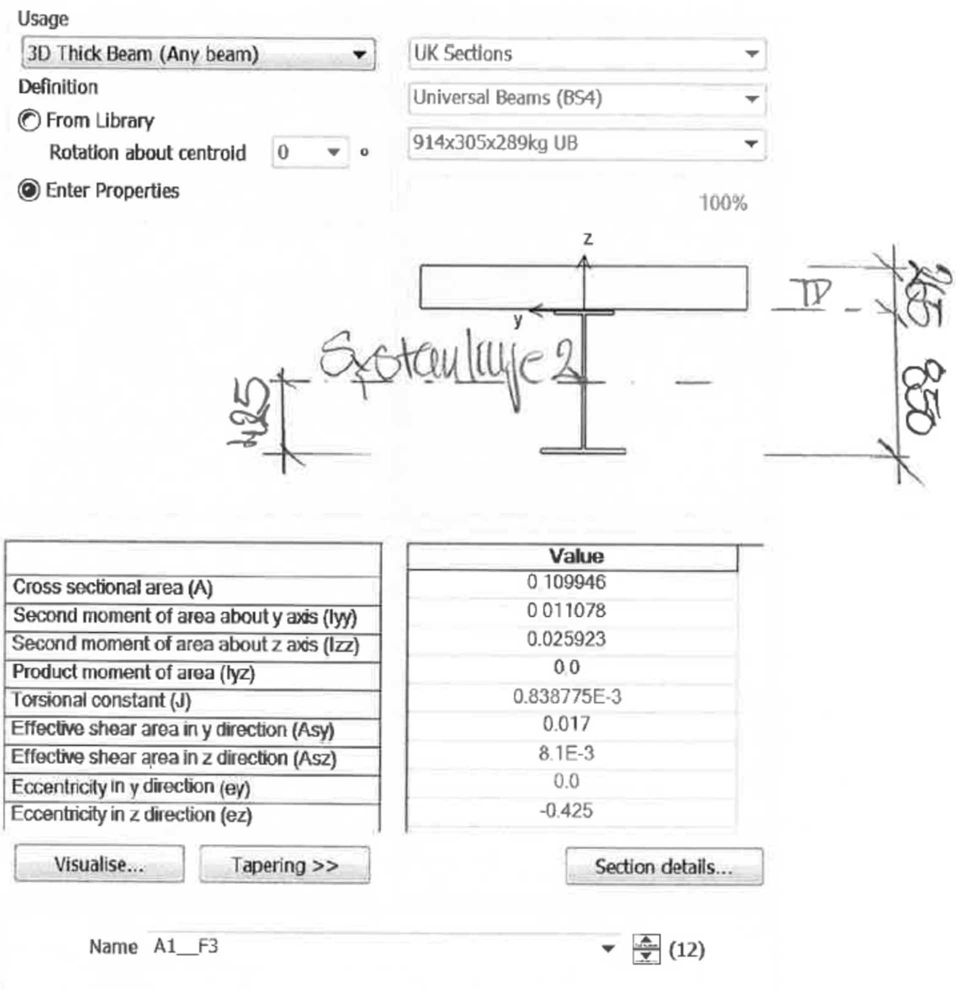
Visualise... Tapering >> Section details...

Name A1__F2a (9)

$$e_z = e_{zel} - 0.425m = 0.149m - 0.425m = -0.276m$$

Anm 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) :



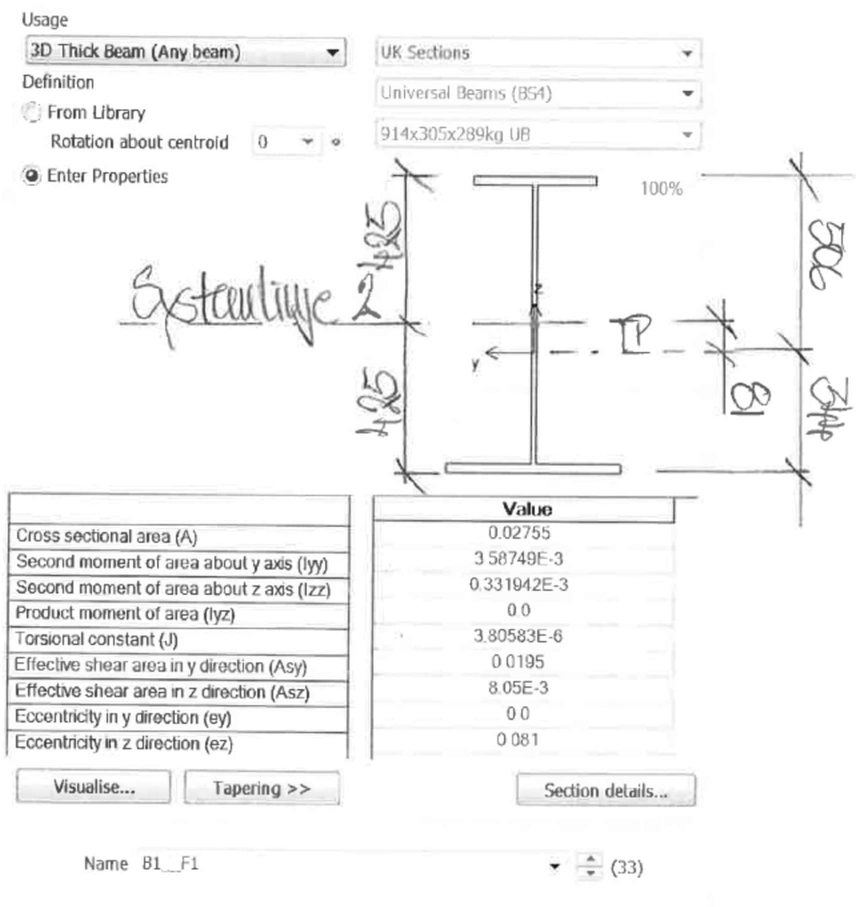
	Value
Cross sectional area (A)	0.109946
Second moment of area about y axis (Iyy)	0.011078
Second moment of area about z axis (Izz)	0.025923
Product moment of area (Iyz)	0.0
Torsional constant (J)	0.838775E-3
Effective shear area in y direction (Asy)	0.017
Effective shear area in z direction (Asz)	8.1E-3
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.425

$$e_z = e_{zel} - 0.425m = 0 - 0.425m = -0.425m$$

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

2.3.2.4.2 Main girder – Segment B

Segment B – Phase 1 (ståltvärsnitt) :

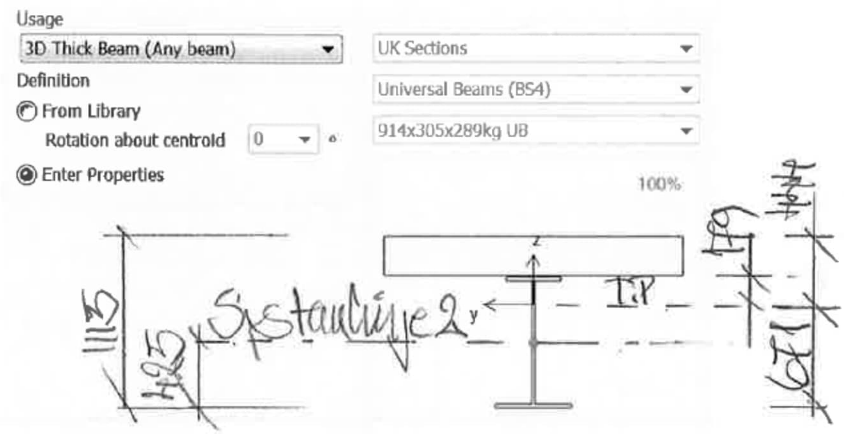


	Value
Cross sectional area (A)	0.02755
Second moment of area about y axis (Iyy)	3.58749E-3
Second moment of area about z axis (Izz)	0.331942E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	3.80583E-6
Effective shear area in y direction (Asy)	0.0195
Effective shear area in z direction (Asz)	8.05E-3
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.081

$$e_z = e_{zel} - 0.425m = 0.506m - 0.425m = 0.081$$

<u>Anm</u> 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)	0.0557482
Second moment of area about y axis (Iyy)	9.55879E-3
Second moment of area about z axis (Izz)	8.02487E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	0.254677E-3
Effective shear area in y direction (Asy)	0.0195
Effective shear area in z direction (Asz)	8.05E-3
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.246

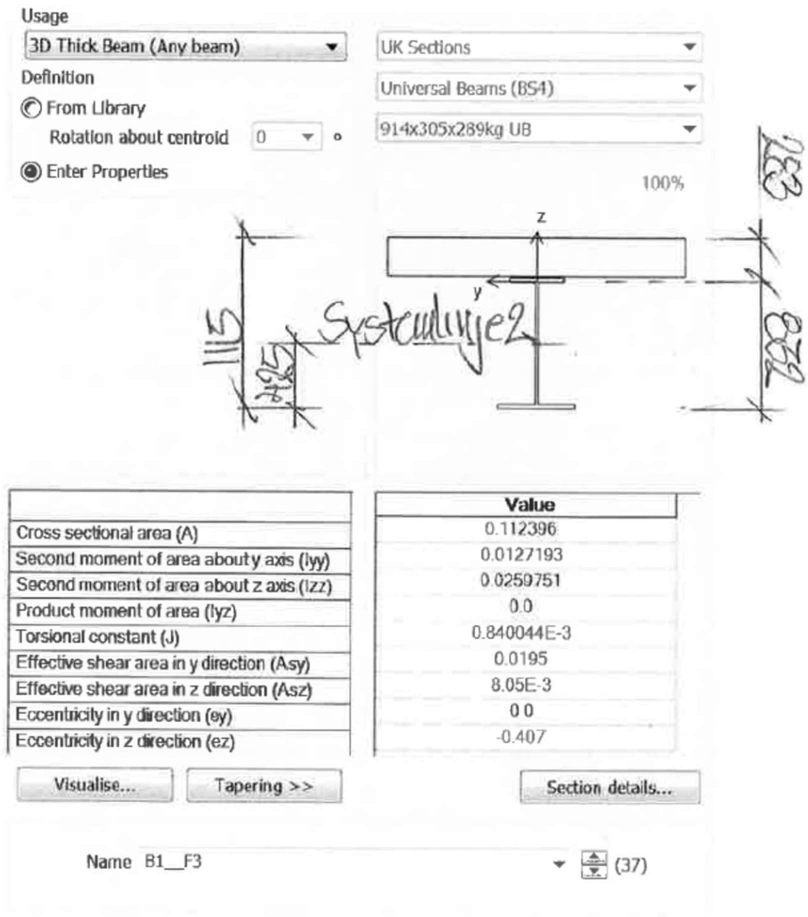
Visualise... Tapering >> Section details...

Name B1__F2a (34)

$$e_z = e_{zel} - 0.425m = 0.179m - 0.425m = -0.246m$$

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

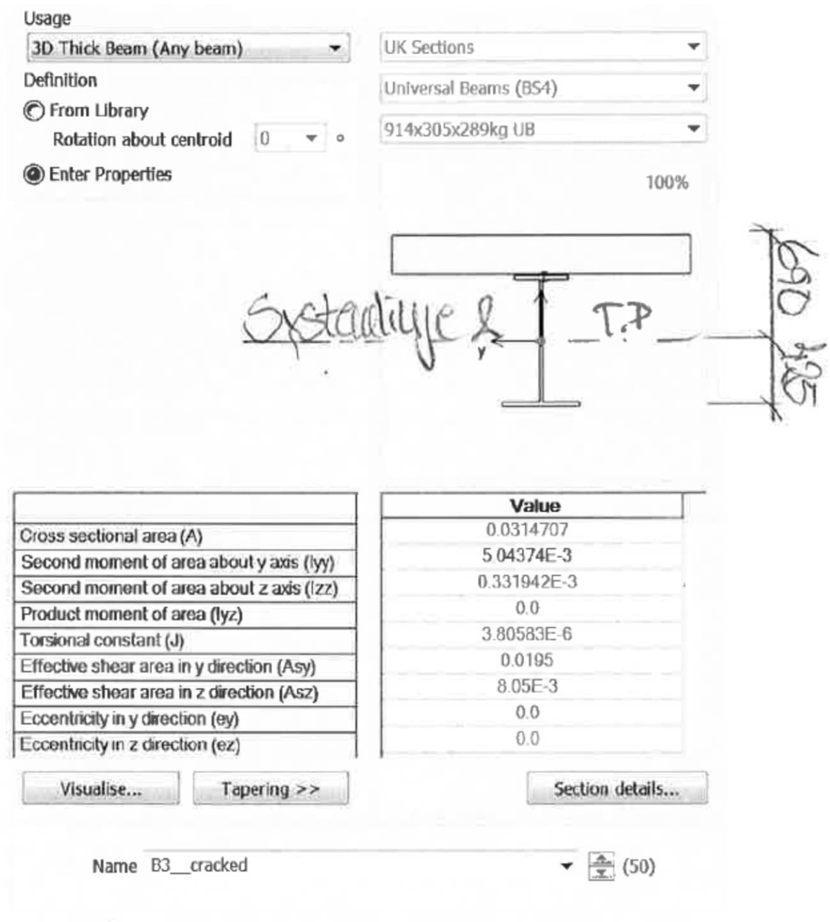


	Value
Cross sectional area (A)	0.112396
Second moment of area about y axis (Iyy)	0.0127193
Second moment of area about z axis (Izz)	0.0259751
Product moment of area (Iyz)	0.0
Torsional constant (J)	0.840044E-3
Effective shear area in y direction (Asy)	0.0195
Effective shear area in z direction (Asz)	8.05E-3
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	-0.407

$$e_z = e_{zel} - 0.425m = 0.018m - 0.425m = -0.407m$$

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) :


Usage
3D Thick Beam (Any beam)
UK Sections
Definition
Universal Beams (BS4)
From Library
Rotation about centroid 0 °
914x305x289kg UB
Enter Properties
100%

	Value
Cross sectional area (A)	0.0314707
Second moment of area about y axis (Iyy)	5.04374E-3
Second moment of area about z axis (Izz)	0.331942E-3
Product moment of area (Iyz)	0.0
Torsional constant (J)	3.80583E-6
Effective shear area in y direction (Asy)	0.0195
Effective shear area in z direction (Asz)	8.05E-3
Eccentricity in y direction (ey)	0.0
Eccentricity in z direction (ez)	0.0

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

Name B3__cracked (50)

$$e_z = e_{zel} - 0.425m = 0.425m - 0.425m = 0m$$

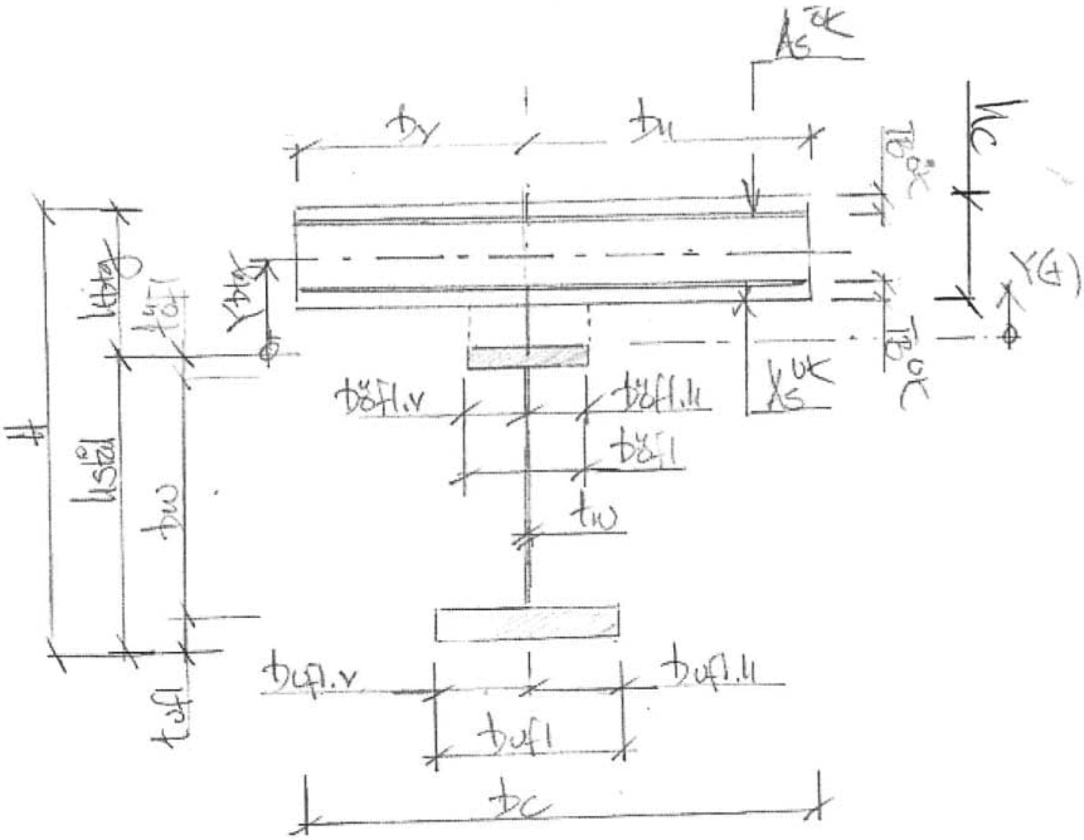
Anm Resultat ovan är bestämd med Point_EC4. Kontroll gentemot PROG T030 för typ 6, se sida A2:84 ger god överensstämmelse.

2.3.2.4.3 Verifiering av tvärsnittskonstanter

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

Objekt: Överbyggnad

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

INDATA

Antal snitt

$N = 6st$

s´
0
8.500
16.000
16.020
19.000
23.000
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				Underkantsarmering			
	$\Phi_{ök}$	c/c	$TB_{ök}$	Kvalitet	Φ_{uk}	c/c	TB_{uk}	Kvalitet
0	16	200	50	B500	16	200	50	B500
8.500	16	200	50	B500	16	200	50	B500
16.000	16	200	50	B500	16	200	50	B500
16.020	16	200	50	B500	16	200	50	B500
19.000	16	200	50	B500	16	200	50	B500
23.000	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

	Överfläns				Liv			Underfläns			
s´	$b_{öfl.v}$	$b_{öfl.h}$	$t_{öfl}$	f_{yk}	b_w	t_w	f_{yk}	$b_{ufl.v}$	$b_{ufl.h}$	t_{ufl}	f_{yk}
0	175	175	20	355	810	10	355	250	250	20	335
8.500	175	175	20	355	810	10	355	250	250	20	335
16.000	175	175	20	355	810	10	355	250	250	20	335
16.020	175	175	20	355	805	10	355	250	250	25	335
19.000	175	175	20	335	805	10	355	250	250	25	335
23.000	175	175	20	335	805	10	355	250	250	25	335
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	950	1000	249	265	140	0.486	2.532
8.500	950	1000	249	265	140	0.486	2.532
16.000	950	1000	249	265	140	0.486	2.532
16.020	950	1000	249	265	140	0.486	2.532
19.000	950	1000	249	265	140	0.486	2.532
23.000	950	1000	249	265	140	0.486	2.532
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

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

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

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

Funktion - ekvivalent armeringsarea

Underkantsarmering

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

Överkantsarmering

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

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

	B_{btg}							
s´	Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8
0	96	0	147	0	316	0	316	0
8.500	96	0	147	0	316	0	316	0
16.000	96	0	147	0	316	0	316	0
16.020	96	0	147	0	316	0	316	0
19.000	96	0	147	0	316	0	316	0
23.000	96	0	147	0	316	0	316	0
m	mm	mm	mm	mm	mm	mm	mm	mm

Effektiv area

	A_{btg}								
s´	Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8	y_{btg}
0	238	0	366	0	789	0	789	0	140
8.500	238	0	366	0	789	0	789	0	140
16.000	238	0	366	0	789	0	789	0	140
16.020	238	0	366	0	789	0	789	0	140
19.000	238	0	366	0	789	0	789	0	140
23.000	238	0	366	0	789	0	789	0	140
m	cm^2	cm^2	cm^2	cm^2	cm^2	cm^2	cm^2	cm^2	mm

Effektiv tröghetsmoment

s´	I_{btg}							
	Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8
0	1.241	0	1.907	0	4.109	0	4.109	0
8.500	1.241	0	1.907	0	4.109	0	4.109	0
16.000	1.241	0	1.907	0	4.109	0	4.109	0
16.020	1.241	0	1.907	0	4.109	0	4.109	0
19.000	1.241	0	1.907	0	4.109	0	4.109	0
23.000	1.241	0	1.907	0	4.109	0	4.109	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	1864	1960	1813	1960	1642	1960	1642	1960	0	207
8.500	1864	1960	1813	1960	1642	1960	1642	1960	0	207
16.000	1864	1960	1813	1960	1642	1960	1642	1960	0	207
16.020	1864	1960	1813	1960	1642	1960	1642	1960	0	207
19.000	1864	1960	1813	1960	1642	1960	1642	1960	0	207
23.000	1864	1960	1813	1960	1642	1960	1642	1960	0	207
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	1864	1960	1813	1960	1642	1960	1642	1960	0	74
8.500	1864	1960	1813	1960	1642	1960	1642	1960	0	74
16.000	1864	1960	1813	1960	1642	1960	1642	1960	0	74
16.020	1864	1960	1813	1960	1642	1960	1642	1960	0	74
19.000	1864	1960	1813	1960	1642	1960	1642	1960	0	74
23.000	1864	1960	1813	1960	1642	1960	1642	1960	0	74
m	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm^2	mm

Stålbalk

s´	$y_{stål}$	$A_{stål}$	$I_{stål}$	$h_{stål}$	H
0	-475	251	33	850	1115
8.500	-475	251	33	850	1115
16.000	-475	251	33	850	1115
16.020	-506	276	36	850	1115
19.000	-506	276	36	850	1115
23.000	-506	276	36	850	1115
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	-153	-392	-96	-392	-4	-392	-4	-392
8.500	-153	-392	-96	-392	-4	-392	-4	-392
16.000	-153	-392	-96	-392	-4	-392	-4	-392
16.020	-183	-425	-123	-425	-22	-425	-22	-425
19.000	-183	-425	-123	-425	-22	-425	-22	-425
23.000	-183	-425	-123	-425	-22	-425	-22	-425
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	527	290	653	290	1072	290	1072	290
8.500	527	290	653	290	1072	290	1072	290
16.000	527	290	653	290	1072	290	1072	290
16.020	551	315	678	315	1097	315	1097	315
19.000	551	315	678	315	1097	315	1097	315
23.000	551	315	678	315	1097	315	1097	315
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	84	46	94	46	110	46	110	46
8.500	84	46	94	46	110	46	110	46
16.000	84	46	94	46	110	46	110	46
16.020	95	50	106	50	126	50	126	50
19.000	95	50	106	50	126	50	126	50
23.000	95	50	106	50	126	50	126	50
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	8074	2086	9500	2086	11817	2086	11817	2086	0
8.500	8074	2086	9500	2086	11817	2086	11817	2086	0
16.000	8074	2086	9500	2086	11817	2086	11817	2086	0
16.020	8900	2219	10563	2219	13328	2219	13328	2219	0
19.000	8900	2219	10563	2219	13328	2219	13328	2219	0
23.000	8900	2219	10563	2219	13328	2219	13328	2219	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	9074	4756	10102	4756	11773	4756	11773	4756	3252
8.500	9074	4756	10102	4756	11773	4756	11773	4756	3252
16.000	9074	4756	10102	4756	11773	4756	11773	4756	3252
16.020	10111	5127	11351	5127	13413	5127	13413	5127	3472
19.000	10111	5127	11351	5127	13413	5127	13413	5127	3472
23.000	10111	5127	11351	5127	13413	5127	13413	5127	3472
m	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3	cm^3

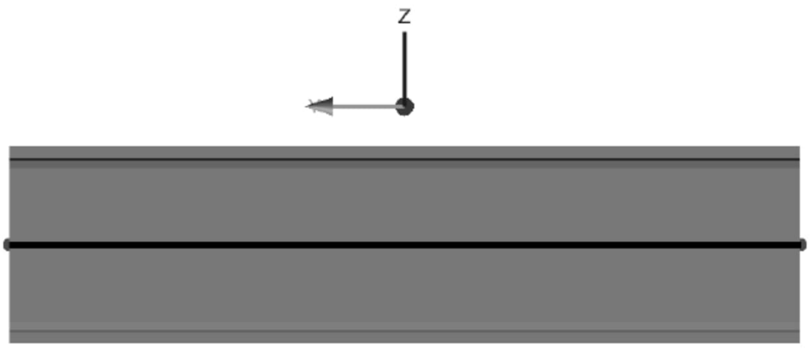
Nivå undre halssvets ($y_3 = - h_{stål} + t_{ufl}$)

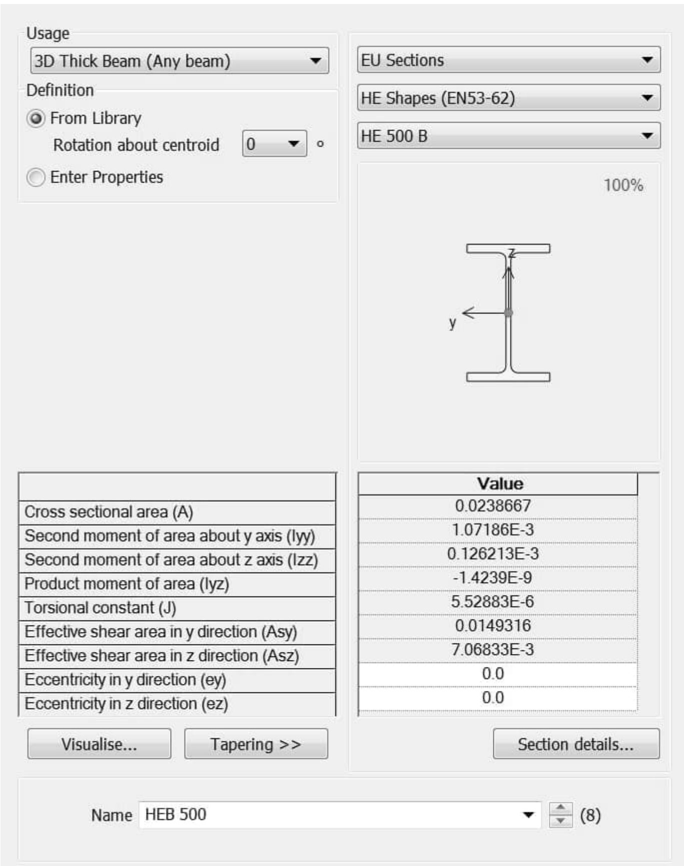
s´	S_3								
	Typ 1	Typ 2	Typ 3	Typ 4	Typ 5	Typ 6	Typ 7	Typ 8	Typ 9
0	6871	4485	7439	4485	8362	4485	8362	4485	3654
8.500	6871	4485	7439	4485	8362	4485	8362	4485	3654
16.000	6871	4485	7439	4485	8362	4485	8362	4485	3654
16.020	8182	5151	8937	5151	10191	5151	10191	5151	4144
19.000	8182	5151	8937	5151	10191	5151	10191	5151	4144
23.000	8182	5151	8937	5151	10191	5151	10191	5151	4144
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 1

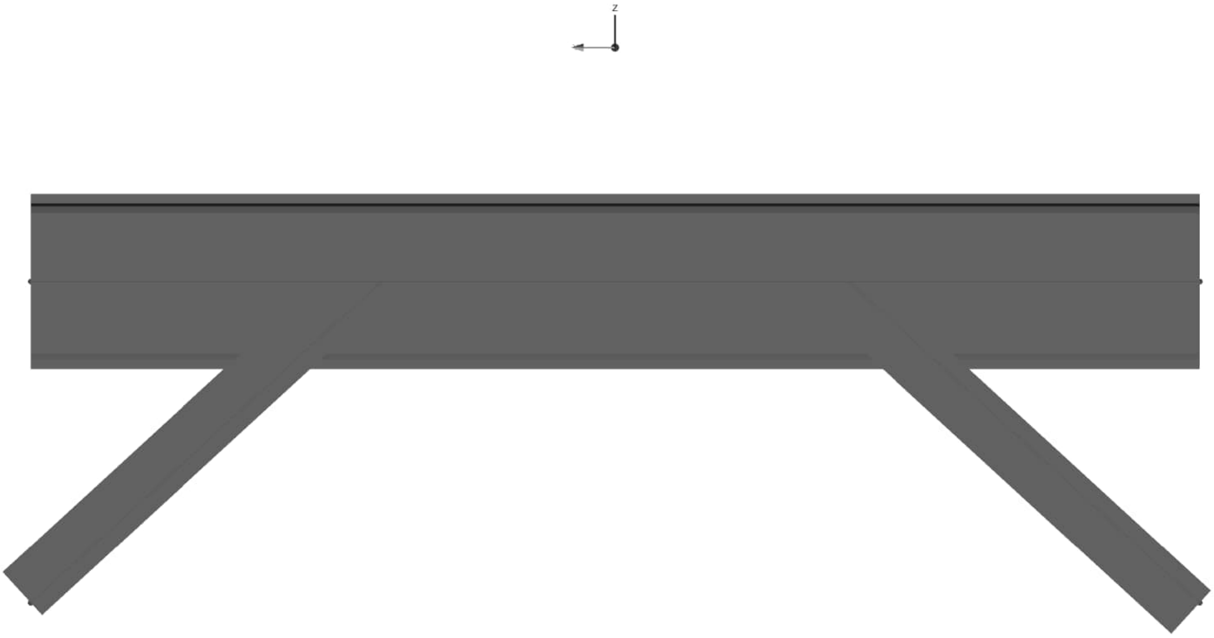
Tvärförband utgörs av en HEB 500 enligt figur nedan.



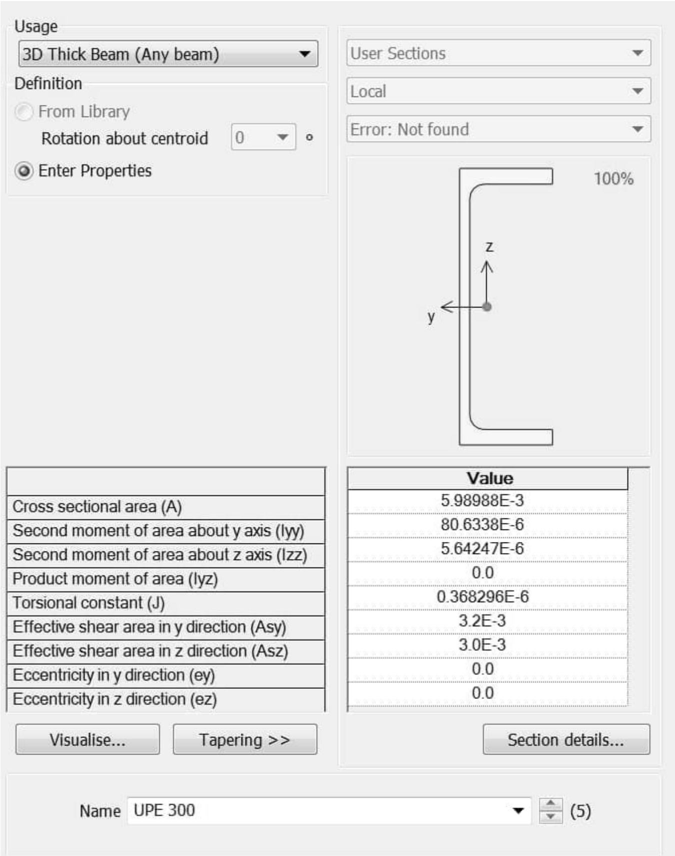


2.3.3.2 Typ 2

Tvärförband utgörs av en överram och 2 st underramar enligt figur nedan.

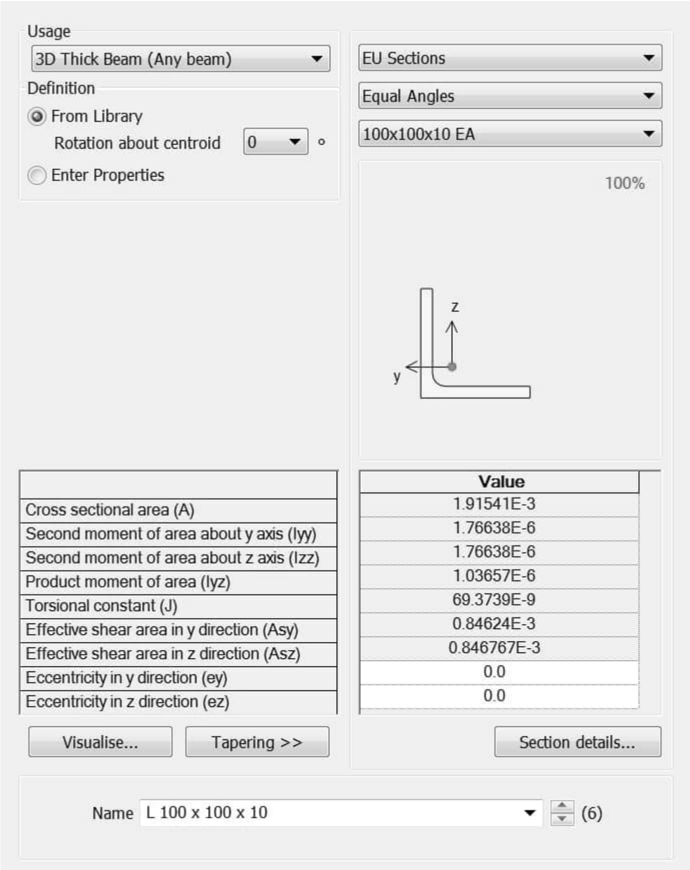


Överram (1 st) :



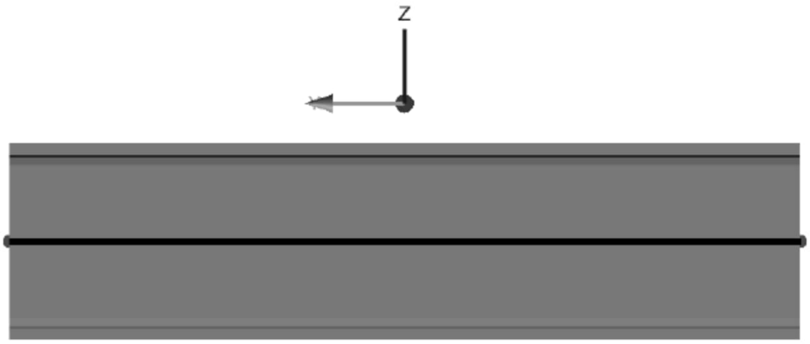
Usage
3D Thick Beam (Any beam)
Definition
From Library
Rotation about centroid
0
Enter Properties
User Sections
Local
Error: Not found
100%
z
y
Value
Cross sectional area (A)
5.98988E-3
Second moment of area about y axis (Iyy)
80.6338E-6
Second moment of area about z axis (Izz)
5.64247E-6
Product moment of area (Iyz)
0.0
Torsional constant (J)
0.368296E-6
Effective shear area in y direction (Asy)
3.2E-3
Effective shear area in z direction (Asz)
3.0E-3
Eccentricity in y direction (ey)
0.0
Eccentricity in z direction (ez)
0.0
Visualise...
Tapering >>
Section details...
Name
UPE 300
(5)

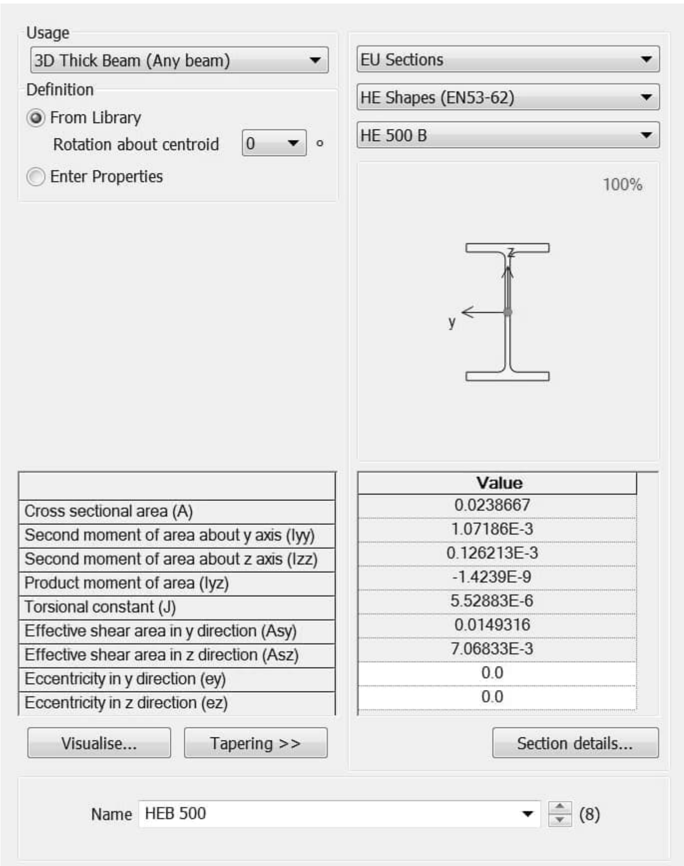
Underrram (2 st):



2.3.3.3 Typ 3

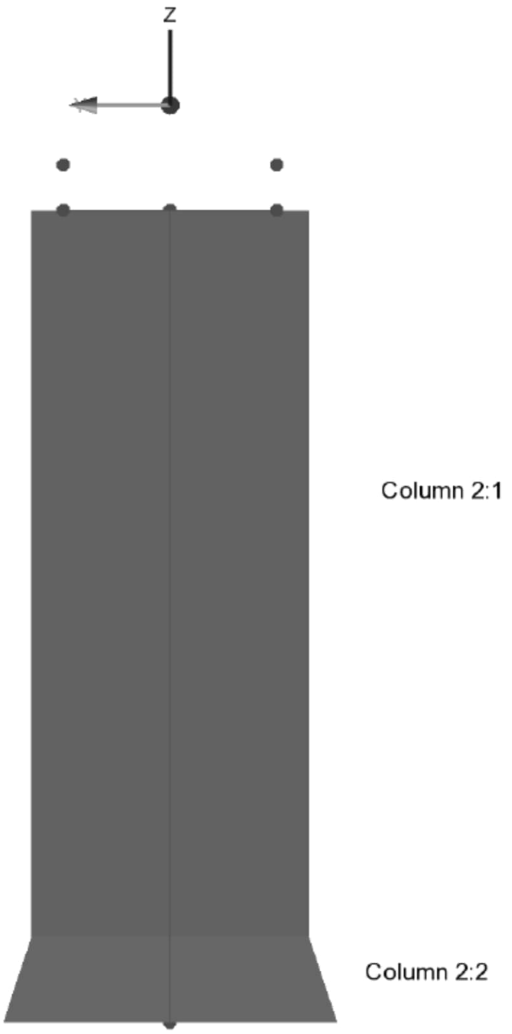
Tvärförband utgörs av en HEB 500 enligt figur nedan.

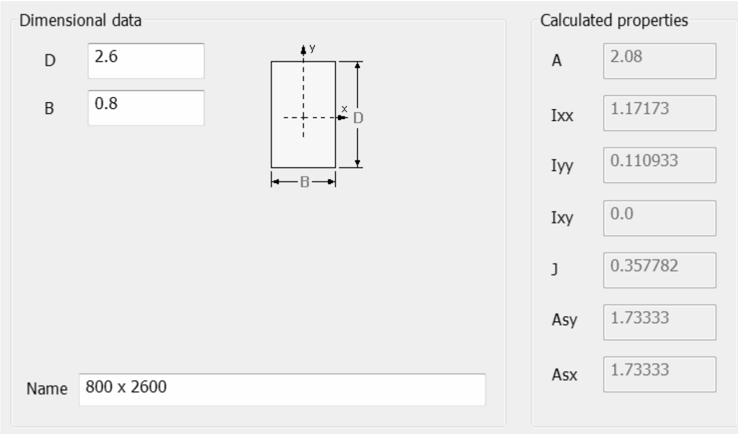




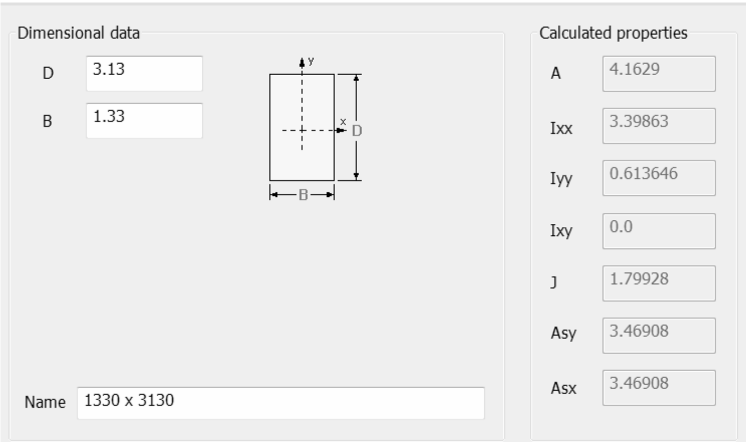
2.3.4 Underbyggnad – stöd 2 (”Thick beam” / BMS3)

Vid bestämning av snittkrafter försummas inverkan av vot 200 x 200 i yttre hörn. Inverkan anses försumbar.



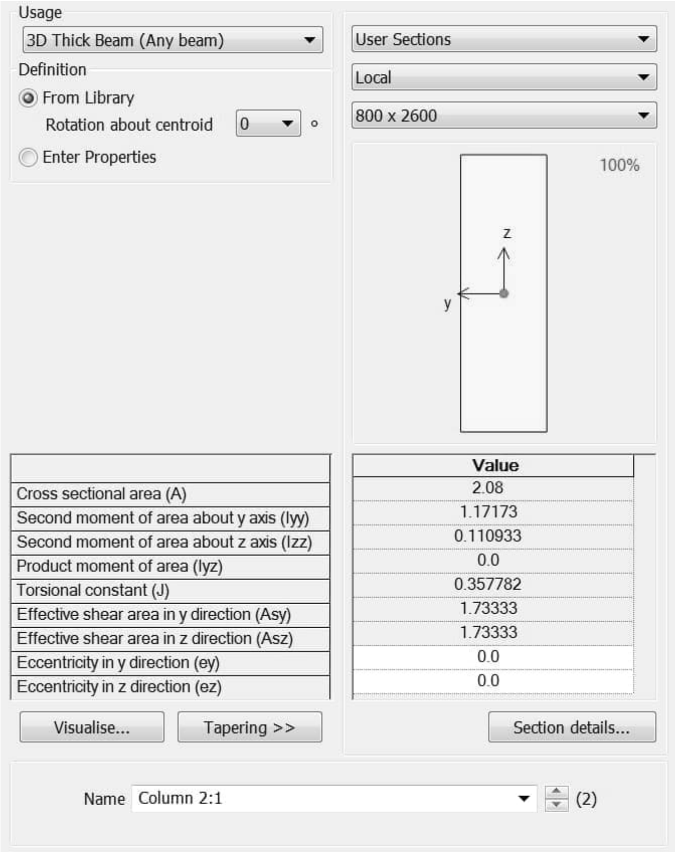


Dimensional data
D
2.6
B
0.8
y
x
D
B
Name
800 x 2600
Calculated properties
A
2.08
Ixx
1.17173
Iyy
0.110933
Ixy
0.0
J
0.357782
Asy
1.73333
Asx
1.73333

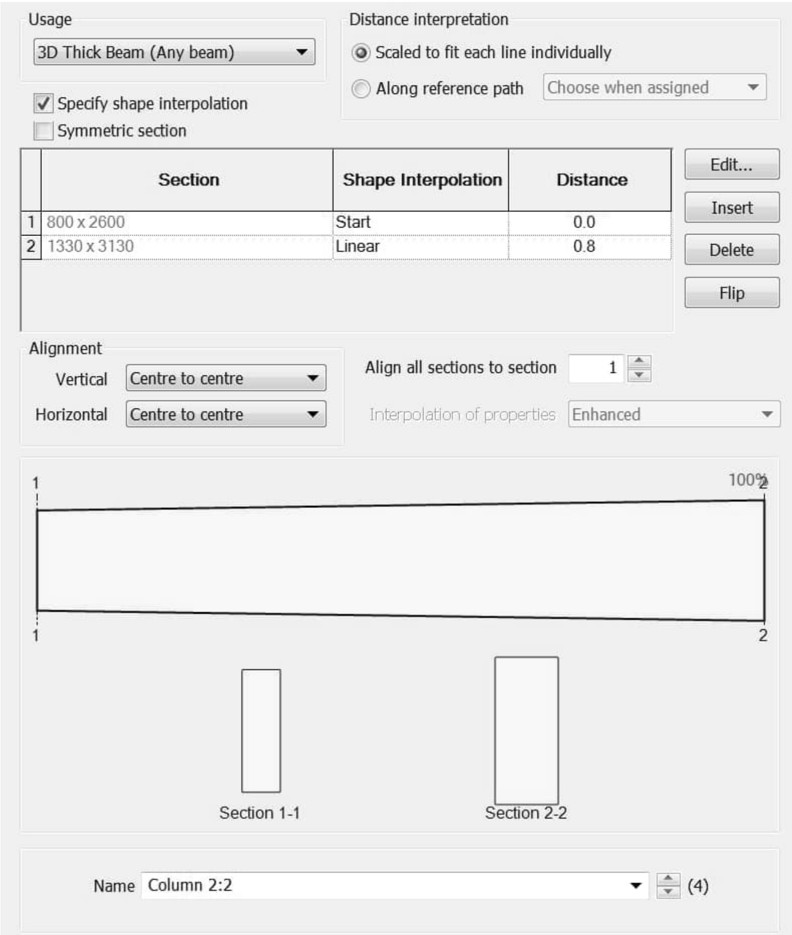


Dimensional data
D
3.13
B
1.33
y
x
D
B
Name
1330 x 3130
Calculated properties
A
4.1629
Ixx
3.39863
Iyy
0.613646
Ixy
0.0
J
1.79928
Asy
3.46908
Asx
3.46908

Column 2:1 :


Usage
3D Thick Beam (Any beam)
Definition
From Library
Rotation about centroid 0 °
Enter Properties
User Sections
Local
800 x 2600
100%
z
y
Value
Cross sectional area (A) 2.08
Second moment of area about y axis (Iyy) 1.17173
Second moment of area about z axis (Izz) 0.110933
Product moment of area (Iyz) 0.0
Torsional constant (J) 0.357782
Effective shear area in y direction (Asy) 1.73333
Effective shear area in z direction (Asz) 1.73333
Eccentricity in y direction (ey) 0.0
Eccentricity in z direction (ez) 0.0
Visualise...
Tapering >>
Section details...
Name Column 2:1 (2)

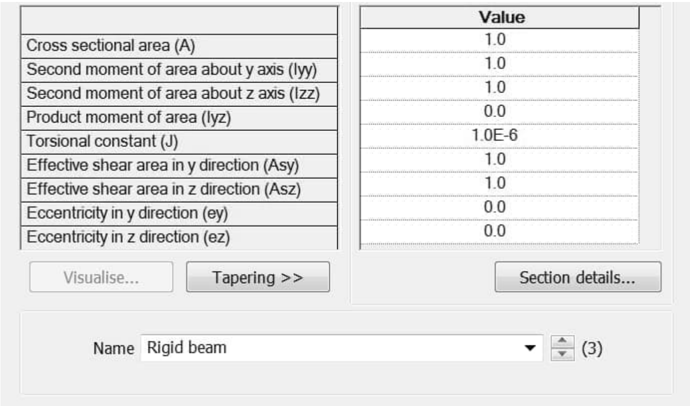
Column 2:2 :



Usage
3D Thick Beam (Any beam)
Specify shape interpolation
Symmetric section
Distance interpretation
Scaled to fit each line individually
Along reference path
Choose when assigned
Section
Shape Interpolation
Distance
1 800 x 2600 Start 0.0
2 1330 x 3130 Linear 0.8
Edit...
Insert
Delete
Flip
Alignment
Vertical
Centre to centre
Horizontal
Centre to centre
Align all sections to section
1
Interpolation of properties
Enhanced
100%
Section 1-1
Section 2-2
Name
Column 2:2
(4)

2.3.5 Rigid beam (”Thick beam” / BMS3)

En fiktiv styv balk med försumbar vridstyvhet används för förbinda lager med med underbyggnad samt tvärförband med huvudbalk.

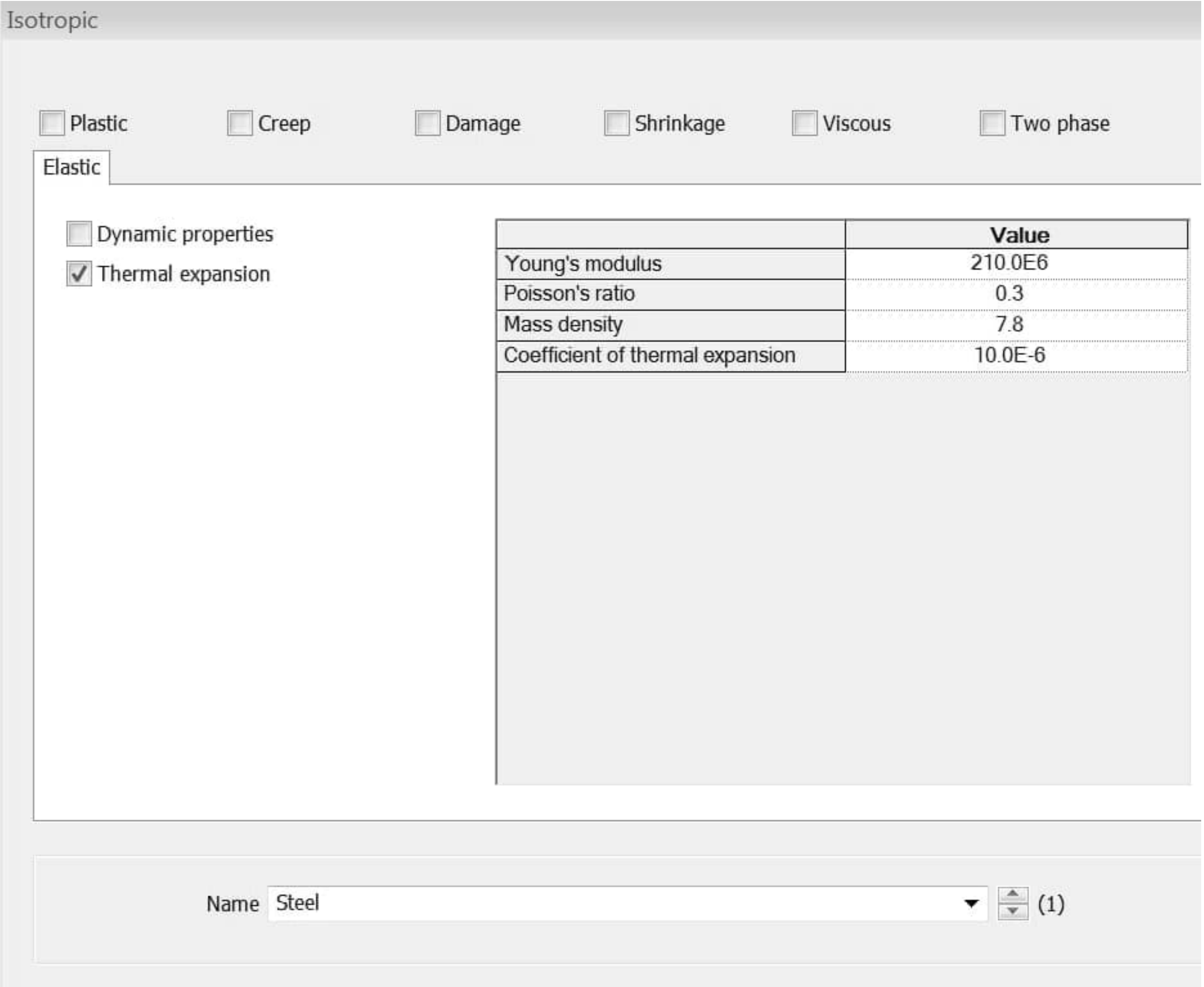


	Value
Cross sectional area (A)	1.0
Second moment of area about y axis (Iyy)	1.0
Second moment of area about z axis (Izz)	1.0
Product moment of area (Iyz)	0.0
Torsional constant (J)	1.0E-6
Effective shear area in y direction (Asy)	1.0
Effective shear area in z direction (Asz)	1.0
Eccentricity in y direction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

2.4 MATERIAL

2.4.1 Stål

Stål : E_s = 210 GPa



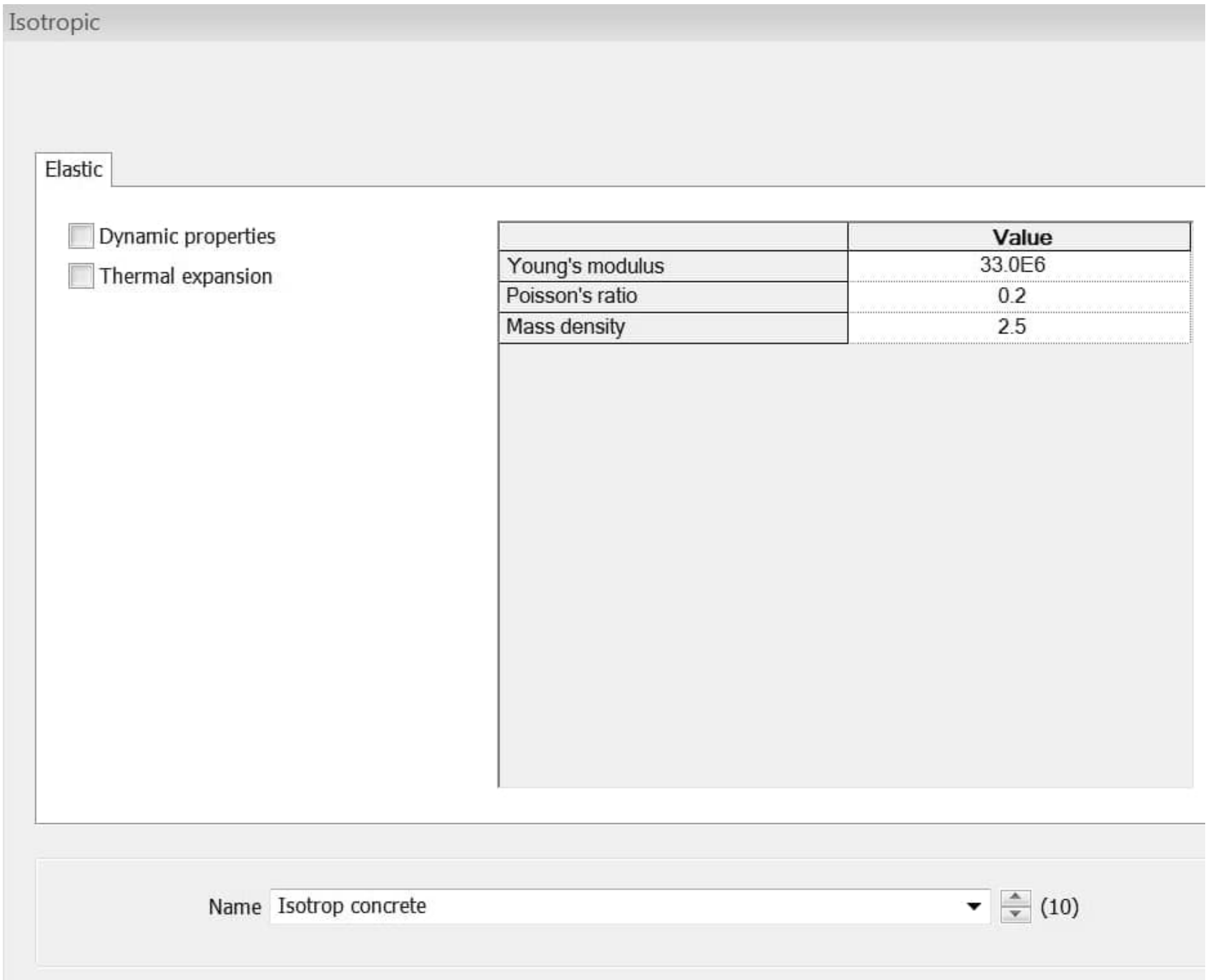
Anm. I ett sent konstruktionsskede påträffades avvikelse vid val längdkoefficient då $\alpha = 10^{-5}$ tillämpats istället för $1.2 \cdot 10^{-5}$. Avvikelse anses försumbar.

2.4.2 Betong

Underbyggnad modelleras såsom ett istropt material medan farbana såsom ett ortropt material med försumbar styvhet i längsled.

2.4.2.1 Isotrop betong

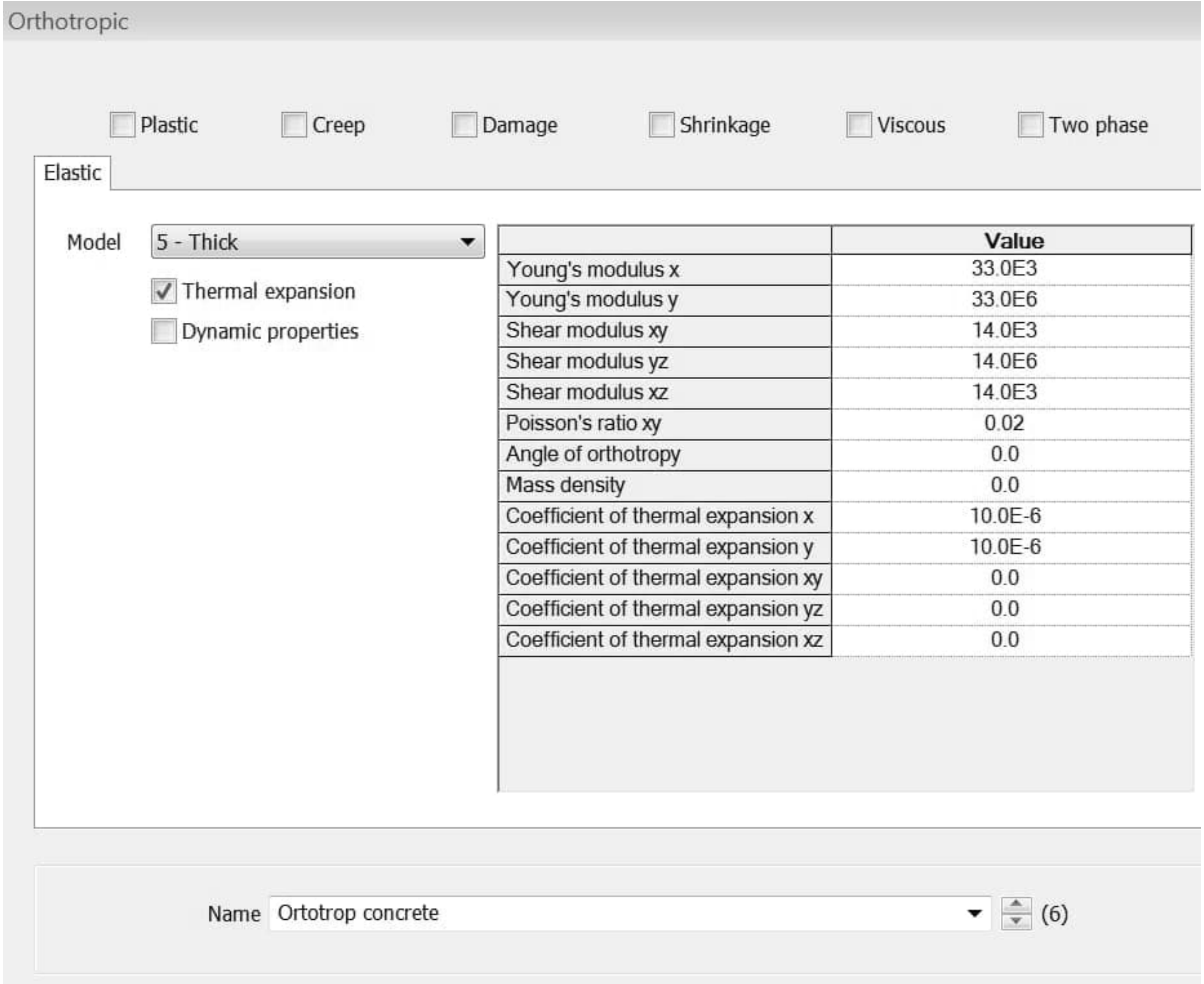
Betong C30/37 i underbyggnad : E_{cm} = 33 GPa



2.4.2.2 Ortotrop betong

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

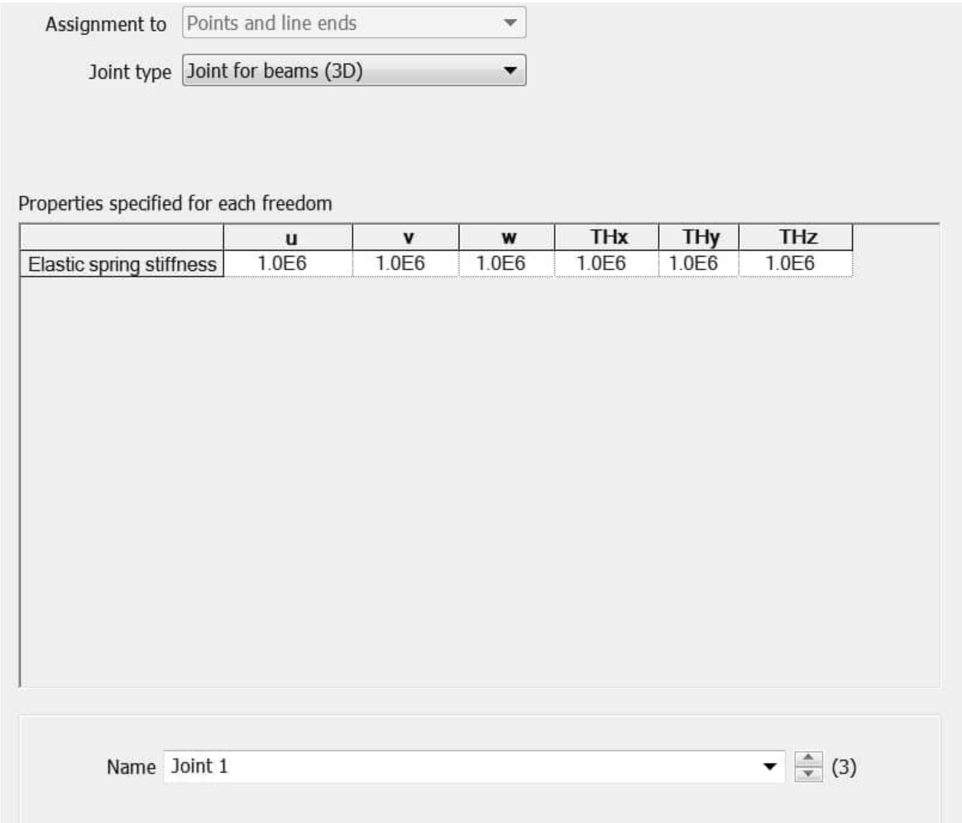
Betong C35/45 i överbyggnad : E_{cm} = 34 GPa

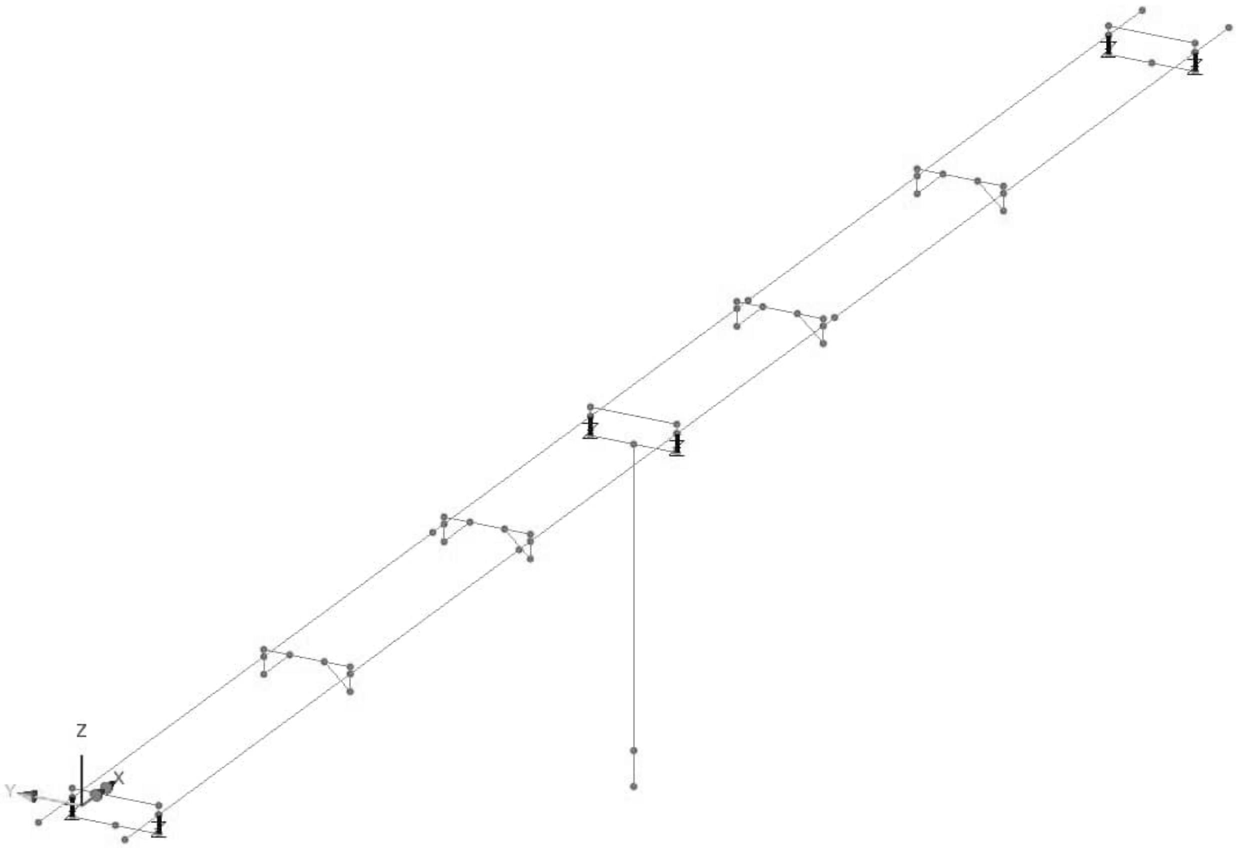


	Value
Young's modulus x	33.0E3
Young's modulus y	33.0E6
Shear modulus xy	14.0E3
Shear modulus yz	14.0E6
Shear modulus xz	14.0E3
Poisson's ratio xy	0.02
Angle of orthotropy	0.0
Mass density	0.0
Coefficient of thermal expansion x	10.0E-6
Coefficient of thermal expansion y	10.0E-6
Coefficient of thermal expansion xy	0.0
Coefficient of thermal expansion yz	0.0
Coefficient of thermal expansion xz	0.0

2.4.3 Fjäderelement

Totalt förekommer 6 st fjädrar betecknade *Joint 1*. Dessa förbinder huvudbalkar med lager.

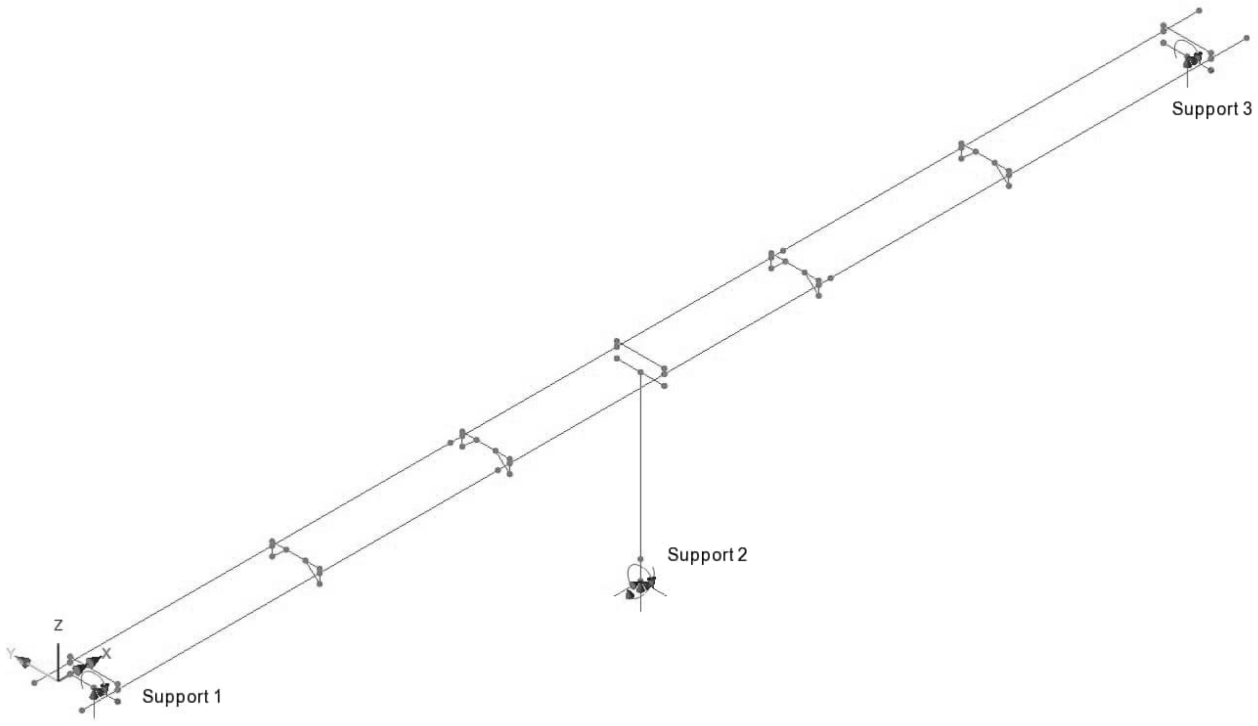




Z
Y
X

2.5 RANDVILLKOR

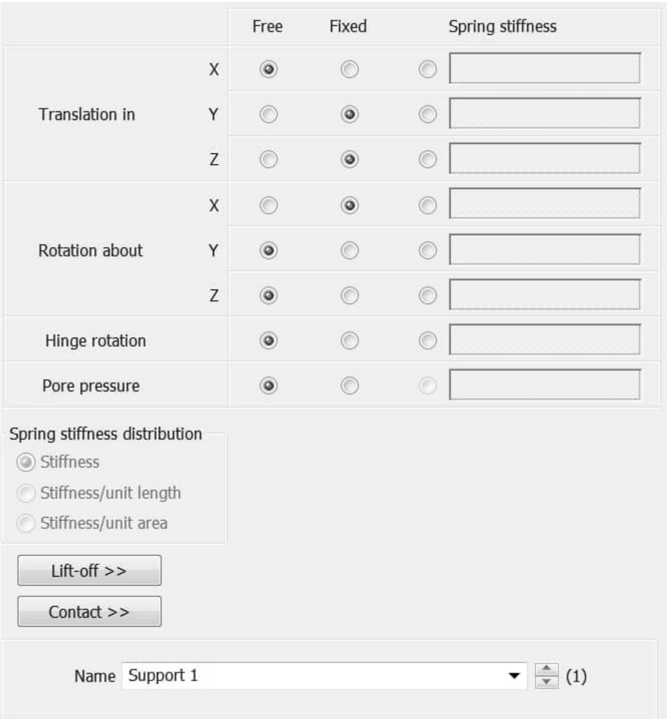
Randvillkor för ”supernoder” vid respektive stöd.



Översikt 3D

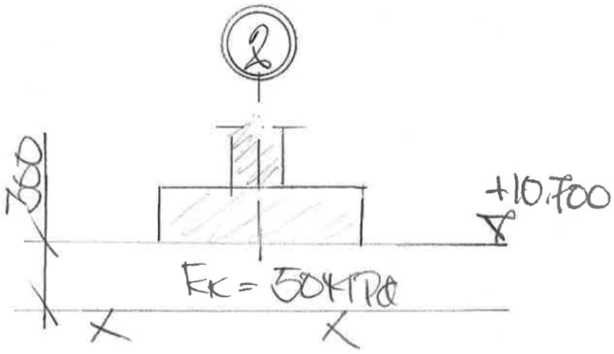
2.5.1 Randvillkor : stöd 1

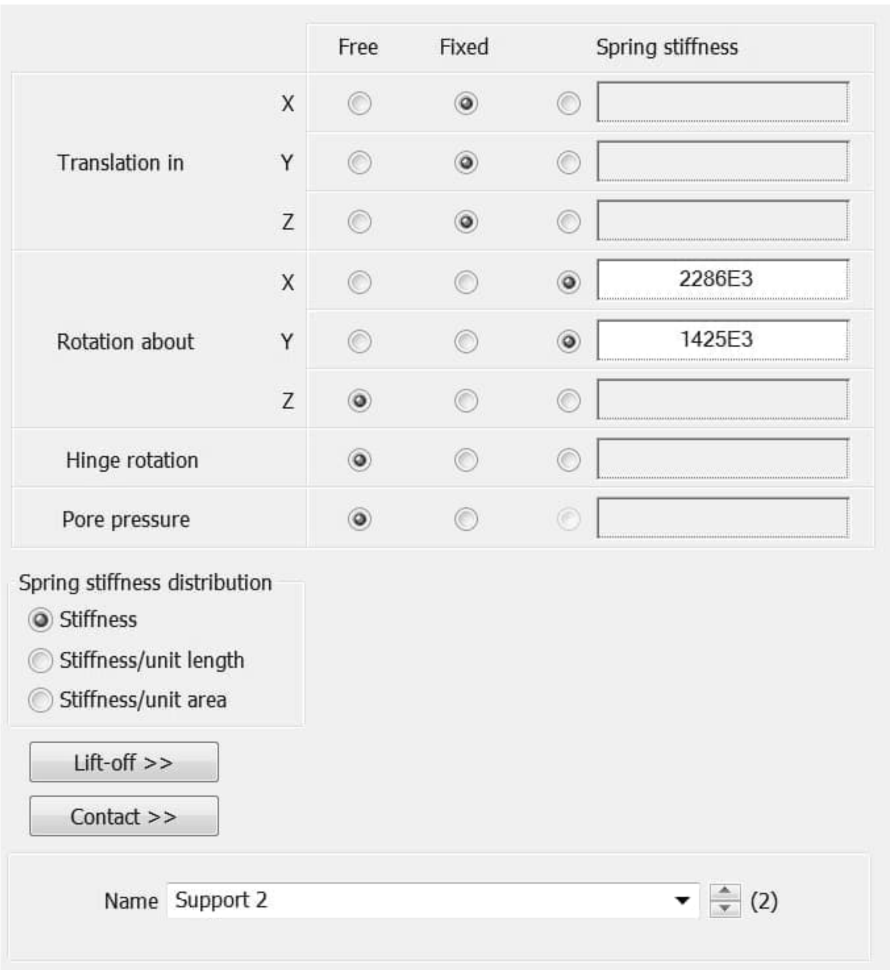
Lagren är utforda såsom ensidigt rörliga lager i längsled (X-riktning).



2.5.2 Randvillkor : stöd 2

Stöd 2 är försedd med fasta lager och elastiskt inspänd i undergrund.





Bestämning av inspänning i grunden sker med program T009 utförd i Mathcad där samtliga formler och delresultat redovisas.

Styvhet i längsled (Rotation about Y) :

$K_{\phi} = 1425 \cdot 10^{3} \frac{kNm}{rad}$: sida A2:110

Styvhet i tvärled (Roation about X) :

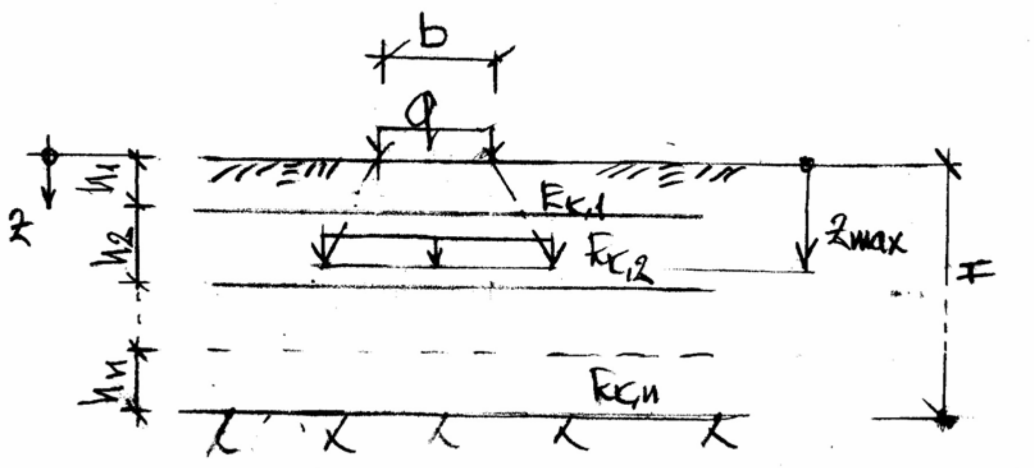
$K_{\phi} = 2286 \cdot 10^{3} \frac{kNm}{rad}$: sida A2:110

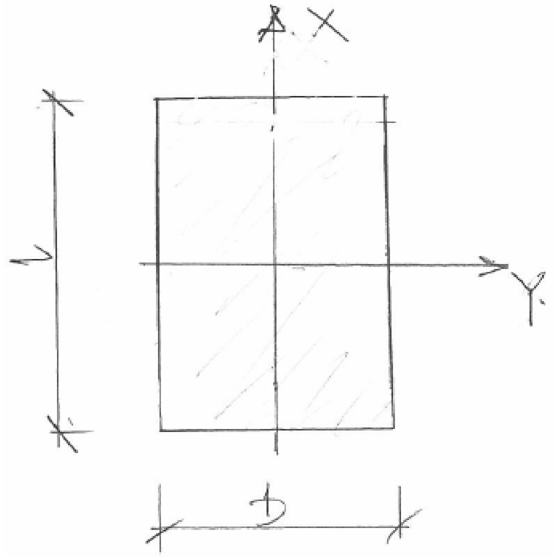
Objekt : Stöd 2

PRINCIPFIGUR

Geometri och undergrund

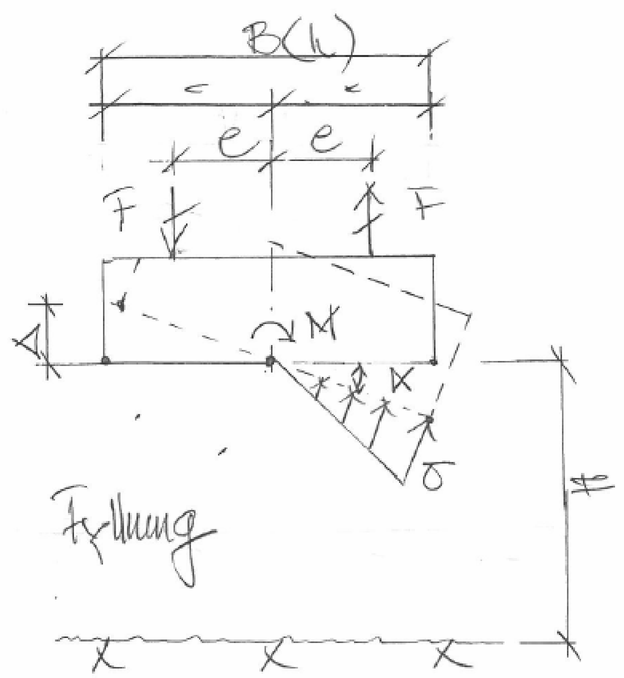
Beräkningen av ekivalent styvhet i grund är utförd enlig TR Bro bilaga CB.6 för en fiktiv lasten motsvarande q (= 100 kPa) . Denna används endast för bestämning av ekvivalent sättningsmodul.





TEORI

Styvheten i undergrunden är utförd enligt härledning nedan.



$$\Delta = \alpha \cdot \frac{B}{2} \;; \qquad \varepsilon = \frac{\Delta}{H} = \frac{\alpha \cdot \frac{B}{2}}{H}$$

$$\sigma = \varepsilon \cdot E'_k = \frac{E'_k \cdot \alpha \cdot B}{2 \cdot H}$$

$$F = \sigma \cdot \frac{B}{2} \cdot \frac{1}{2} \cdot L = \frac{E'_k \cdot \alpha \cdot B}{2 \cdot H} \cdot \frac{B \cdot L}{4} = \frac{E'_k \cdot \alpha \cdot B^2 \cdot L}{8 \cdot H}$$

$$M = F \cdot 2e \;; \qquad e = \frac{B}{3} \;;$$

$$M = F \cdot \frac{2 \cdot B}{3} = \alpha \cdot \frac{L \cdot B^3 \cdot E'_k}{12 \cdot H}$$

$$\Rightarrow \frac{\alpha}{M} = \frac{12 \cdot H}{L \cdot B^3 \cdot E'_k}$$

INDATA

Geometri

Bottenplatta : $b = 3.0m$ $l = 3.8m$

Underliggande jordmaterial

Antal skikt (minst 2 skickt erfordras): $n = 2st$

Skikt	E_k	h
1	50	0.15
2	50	0.15
-	MPa	m

BERÄKNINGAR

Total skikttjocklek

$$H = \sum_{i=1}^{n} h_i$$

$$H = 0.3\,m$$

Sättningsområde

$$z_{max} = \min(2 \cdot b, H)$$

$$z_{max} = 0.3\,m$$

Nivåer för respektive skikt

$$z_s = \left|\begin{array}{l} \text{for } i \in 1..n \\ \quad \left|\begin{array}{l} z_{2\cdot i} \leftarrow z_{2\cdot i-1} + h_i - 1mm \\ z_{2\cdot i+1} \leftarrow z_{2\cdot i} + 1mm \end{array}\right. \\ z \end{array}\right.$$

$$z_s^T = \begin{pmatrix} 0.000 & 0.150 & 0.151 & 0.300 & 0.301 \end{pmatrix} m$$

Funktion för sättningsmodul

$$E_{sk} := \left| \begin{array}{l} \text{for } i \in 1..n-1 \\ \quad \left| \begin{array}{l} E_{2\cdot i} \leftarrow E_{k_i} \\ E_{2\cdot i+1} \leftarrow E_{k_{i+1}} \end{array} \right. \\ E \end{array} \right.$$

$$E_{sk}^{T} = \left(50 \quad 50 \quad 50 \quad 50 \quad 1000 \right)\cdot \text{MPa}$$

$$E_k := \text{linterp}\left(z_s, E_{sk}, z\right)$$

Påkänningar enligt 2:1

$$q = 100\text{kPa}$$

$$\Delta\sigma_v = q\cdot\frac{b\cdot l}{(b+z)\cdot(l+z)}$$

Karakteristisk sättning

$$s_k = \int_{0m}^{H} \frac{\Delta\sigma_v}{E_k}\,dz \qquad s_k = 0.6\cdot\text{mm}$$

Ekvivalent sättningsmodul

$$E'_k = \frac{\int_{0m}^{z_{max}} \Delta\sigma_v\,dz}{s_k} \qquad E'_k = 50\cdot\text{MPa}$$

Funktion för styvhet grunden
(Se härledning avsnitt TEORI)

$$k_{\theta k}(B,L) = \frac{L \cdot B^3 \cdot E'_k}{12H}$$

Rotation kring plattans korta riktning (x-x riktning)

$$k_{\theta k}(b,l) = 1425 \cdot \frac{MNm}{rad}$$

$$C_\phi = \frac{1}{k_{\theta k}(b,l)} \qquad 10^9 \cdot C_\phi = 702 \cdot \frac{rad}{kNm}$$

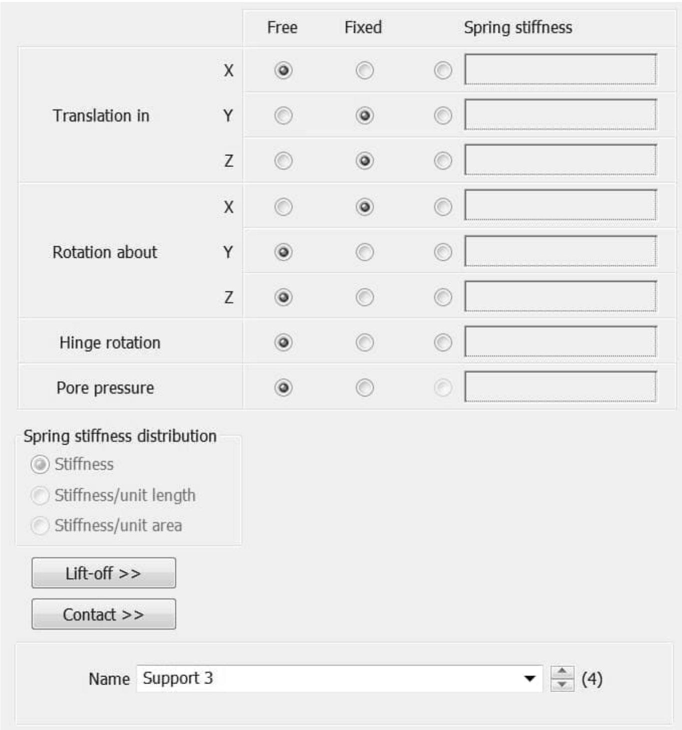
Rotation kring plattans långa riktning (y-y riktning)

$$k_{\theta k}(l,b) = 2286 \cdot \frac{MNm}{rad}$$

$$C_\eta = \frac{1}{k_{\theta k}(l,b)} \qquad 10^9 \cdot C_\eta = 437 \cdot \frac{rad}{kNm}$$

2.5.3 Randvillkor : stöd 3

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

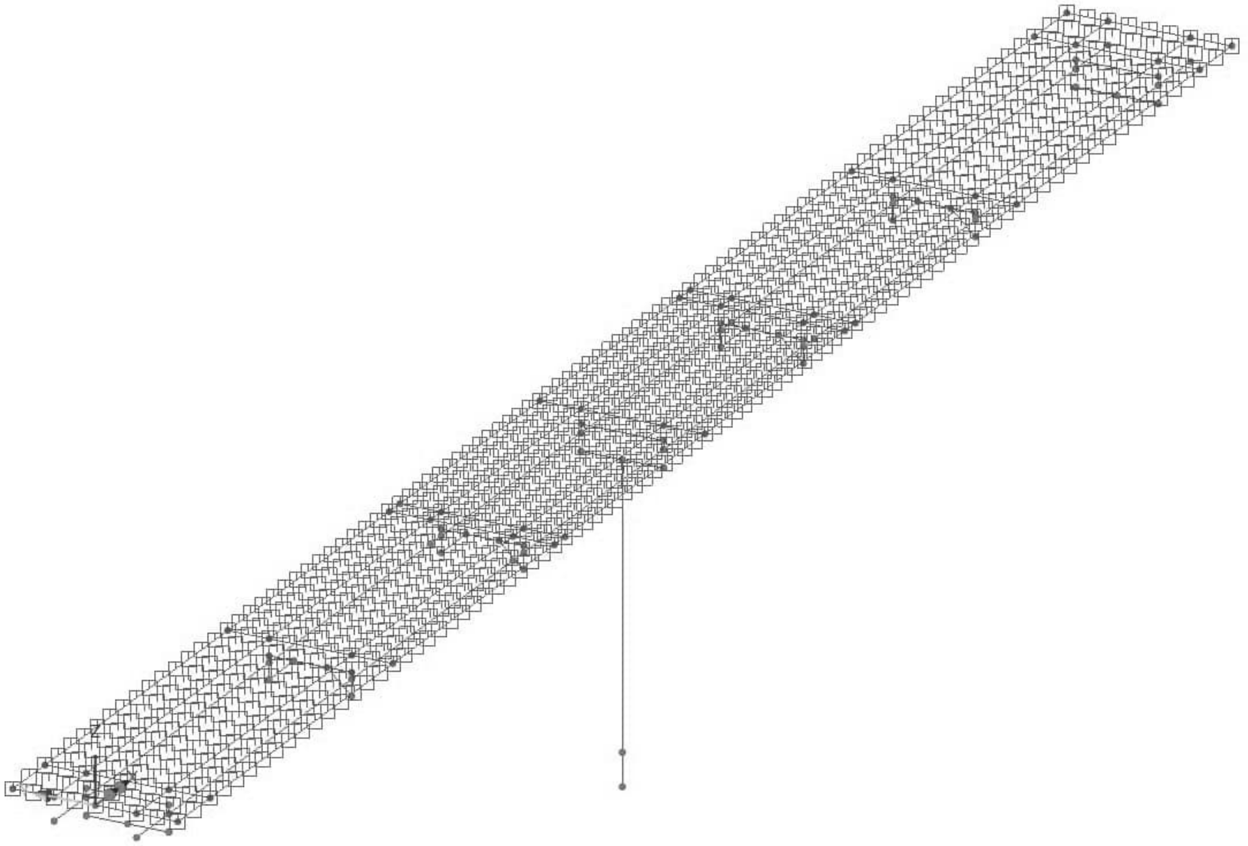


-

2.6 BELASTNINGSYTOR

Diskreta last kan påföras konstruktionen genom olika belastningsytor. Dessa betecknas sökområden (*Search Area*).

Konstruktionsdel : *DECK*



2.7 MESH

2.7.1 Skalelement (QTS4): linear

Skalement utför regelbundna. Det förekommer totalt 6 st elementtyper enligt redovisning nedan.

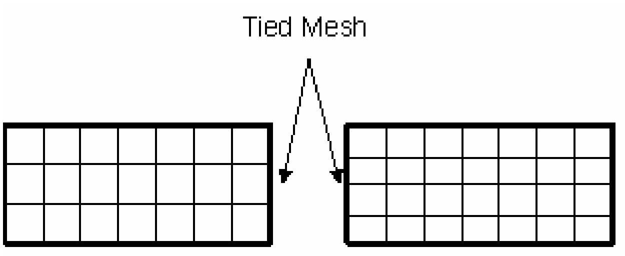
Typ	x-divisions	y-divisions
Element 1 x 2	1	2
Element 2 x 2	2	2
Element 1 x 4	1	4
Element 2 x 4	2	4
Element 1 x 14	1	14
Element 1 x 14	2	14

2.7.2 Balklelement (BMI21) : linear

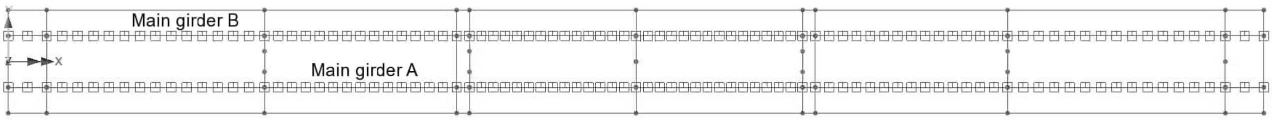
Typ	Divisions	End release: Start	End release: End	Konstruktionsdel
BEAM x 1	1	None	None	Column 2:2
BEAM x 2	2	None	None	Huvudbalk
BEAM x 4	1	None	None	Column 2:1
BEAM x 14	2	None	None	Huvudbalk
BEAM x 1 : Pinned (end)	1	None	Pinned	Tvärförband typ 2
BEAM x 1 : Pinned (start)	2	Pinned	None	Tvärförband typ 2

2.7.3 Anslutningar

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



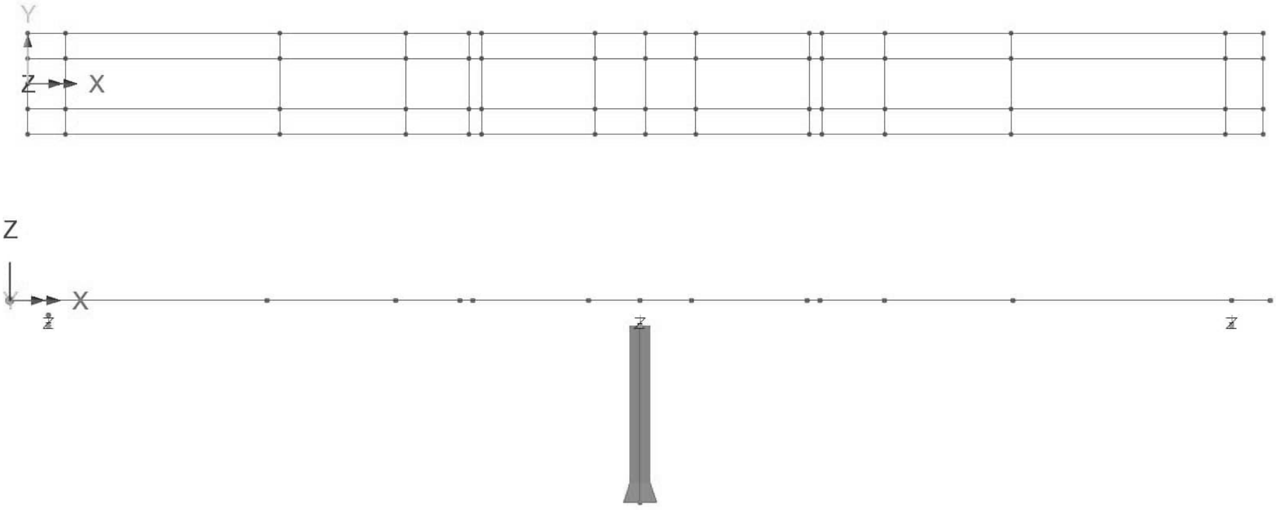
Farbana utformas som *Master* medan *huvudbalkar* som *Slave.*



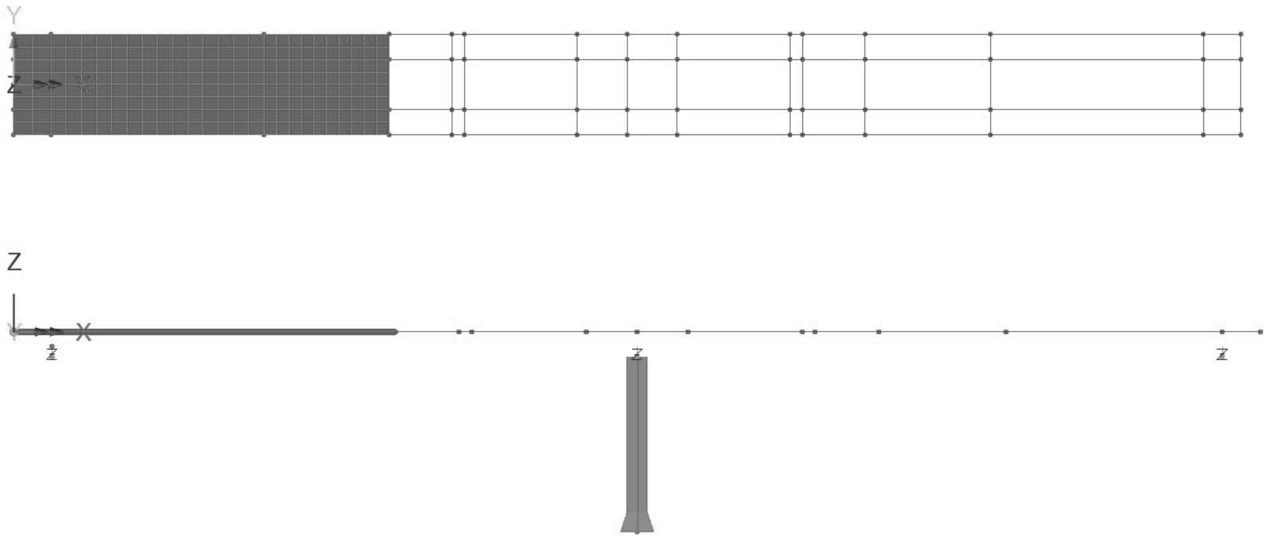
2.8 ETAPPVISUTBYGGNAD

Total förekommer 5 skeden varav 3 st byggskeden och ett driftskede. I de olika skedena aktiveras/deaktiveras farbanan.

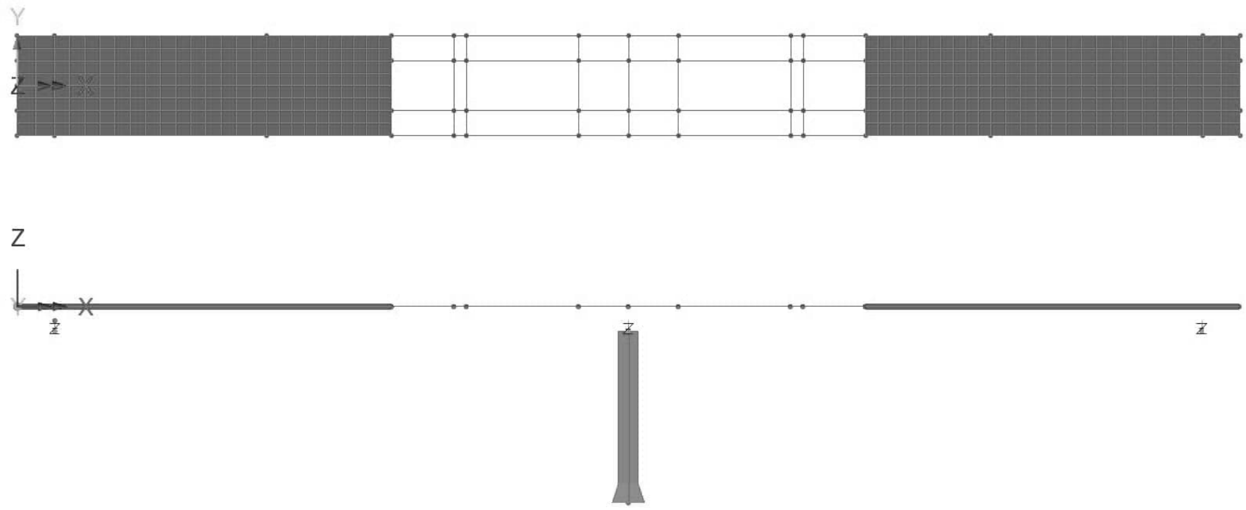
2.8.1 Byggskede - gjutetapp I : *Analysis Stage I*



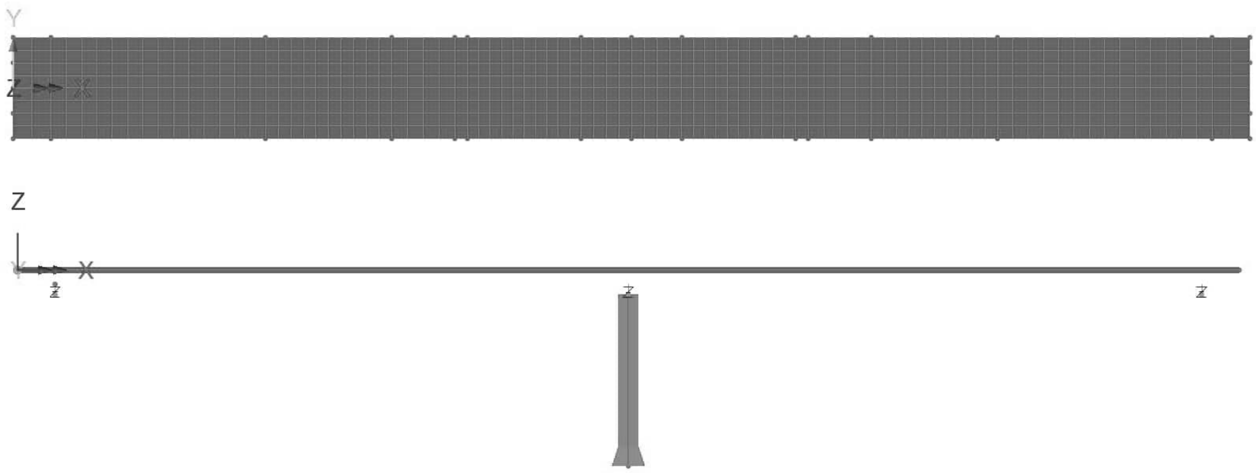
2.8.2 Byggskede - gjutetapp II : *Analysis Stage II*



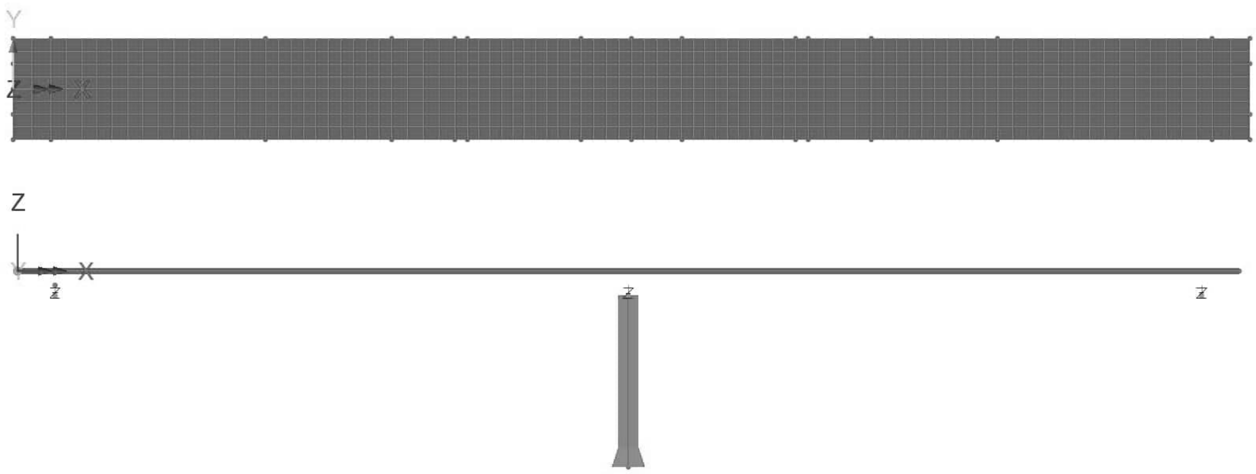
2.8.3 Byggskede - gjutetapp III : *Analysis Stage III*



2.8.4 Driftskede : *Analysis DRIFT-P*



2.8.5 Driftskede : *Analysis DRIFT-V*



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)

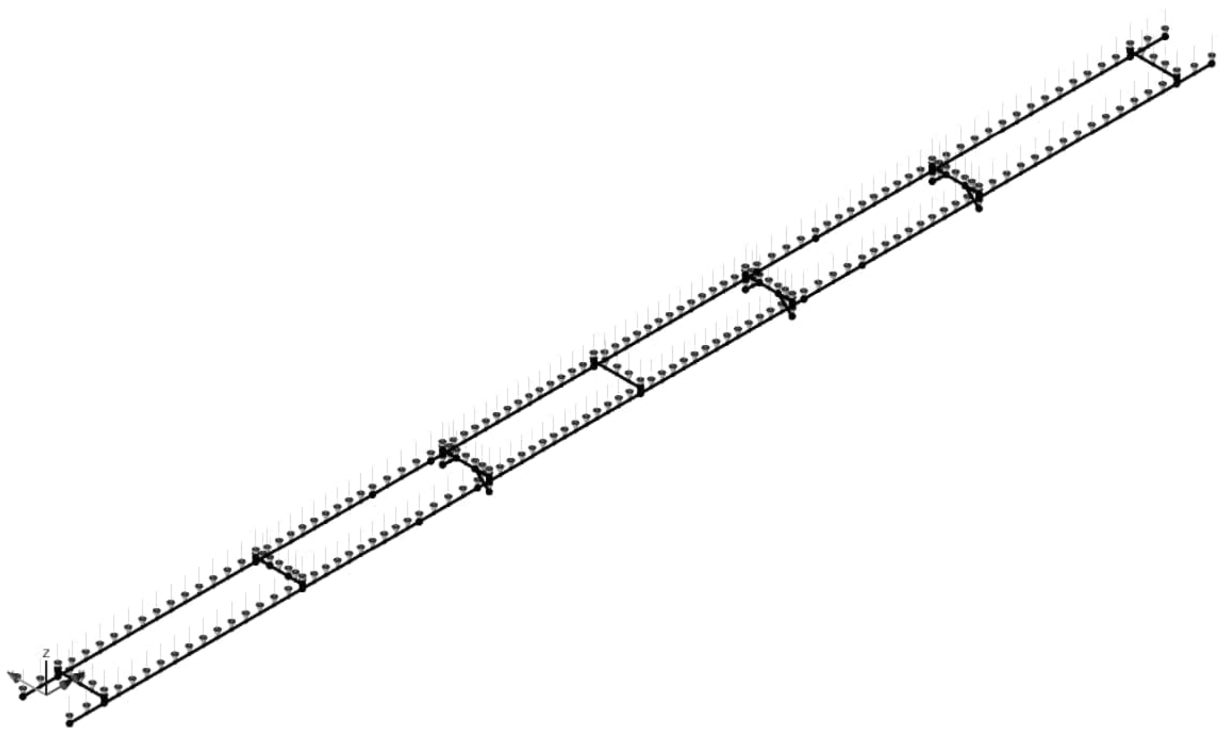
Load : EGEN-1-1

Structural loading : Body force

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

Loadcase : EGEN 1-1

Analys : Stage I



3.1.2 Underbyggnad (EGEN_1-2)

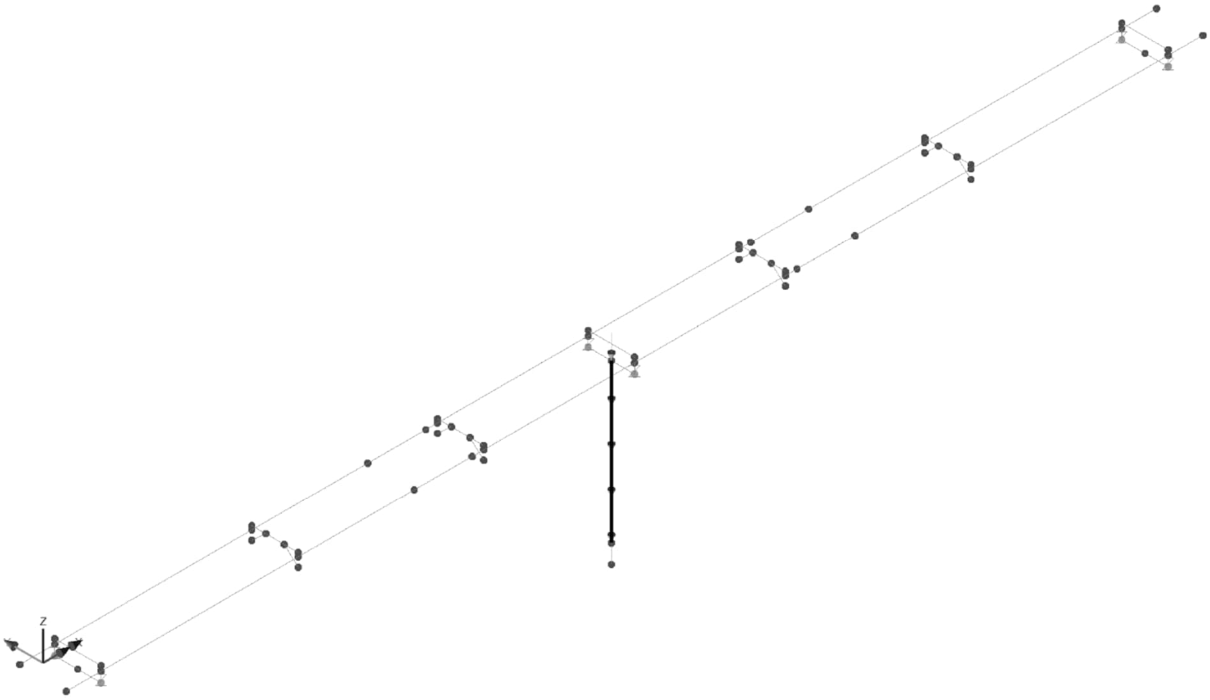
Load : EGEN_1-2

Structural loading : Body force

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

Loadcase : EGEN_1-2

Analys : Stage I



3.1.3 Farbana gjutetapp I (EGEN_1-3)

$A_c^{platta} = 0.486m^2$: se sida A2:59

$A_c^{KB} = 0.40m \cdot 0.40m = 0.16m^2$

$\Rightarrow A_c = 0.486m^2 + 0.16m^2 = 0.646m^2$

$$p_z = A_c \cdot \gamma = 0.646m^2 \cdot 25\frac{kN}{m^3} = 16.2\frac{kN}{m}$$

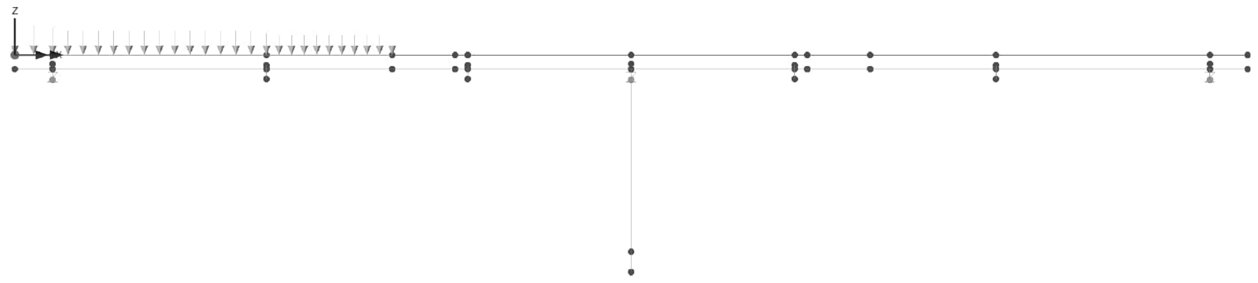
Load : EGEN 1-3

Structural loading : Global distributed

Load per unit length in Z direction (p_z) : -16.2 $\frac{kN}{m}$

Loadcase : EGEN_1-3

Analys : Stage I



3.1.4 Farbana gjutetapp II (EGEN_2)

$A_c^{platta} = 0.486 m^2$: se sida A2:59

$A_c^{KB} = 0.40m \cdot 0.40m = 0.16m^2$

$\Rightarrow A_c = 0.486m^2 + 0.16m^2 = 0.646m^2$

$$p_z = A_c \cdot \gamma = 0.646m^2 \cdot 25\frac{kN}{m^3} = 16.2\frac{kN}{m}$$

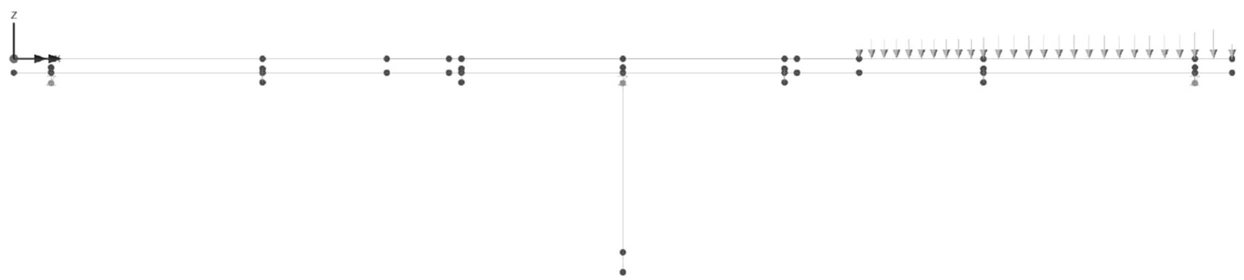
Load : EGEN 2

Structural loading : Global distributed

Load per unit length in Z direction (p_z) : $-16.2\frac{kN}{m}$

Loadcase : EGEN_2

Analys : Stage II



3.1.5 Farbana gjutetapp III (EGEN_3)

$A_c^{platta} = 0.486 m^2$: se sida A2:59

$A_c^{KB} = 0.40m \cdot 0.40m = 0.16m^2$

$\Rightarrow A_c = 0.486m^2 + 0.16m^2 = 0.646m^2$

$$p_z = A_c \cdot \gamma = 0.646m^2 \cdot 25\frac{kN}{m^3} = 16.2\frac{kN}{m}$$

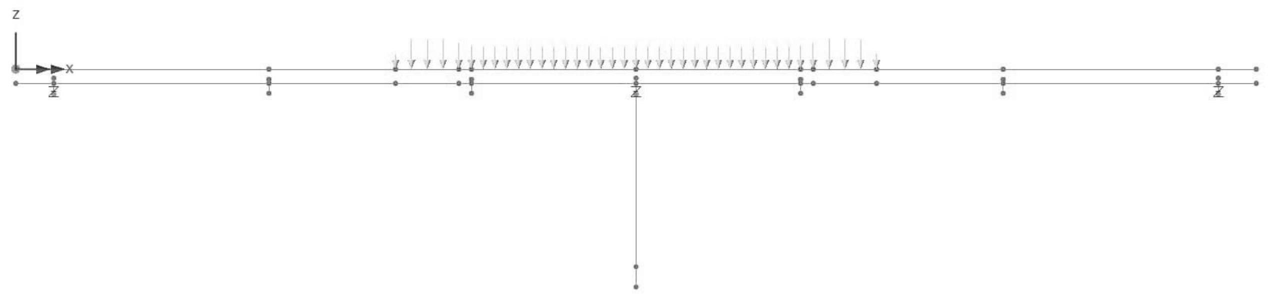
Load : EGEN 3

Structural loading : Global distributed

Load per unit length in Z direction (p_z) : -16.2 $\frac{kN}{m}$

Loadcase : EGEN_3

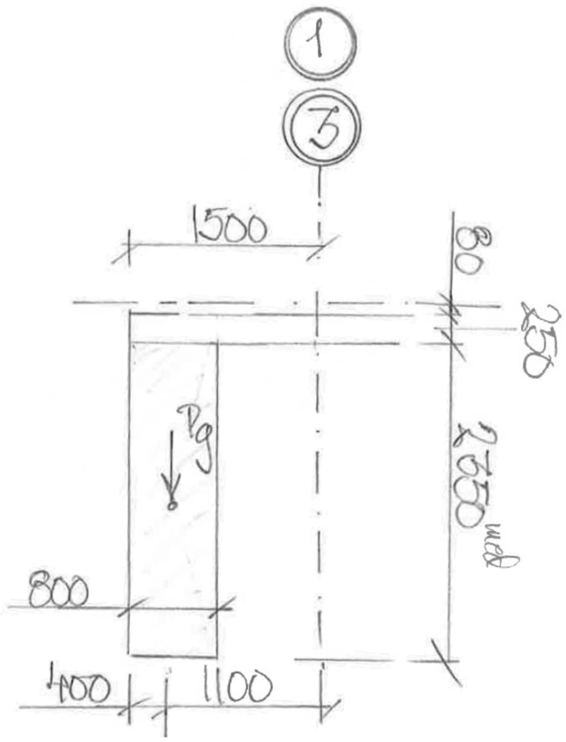
Analys : Stage III

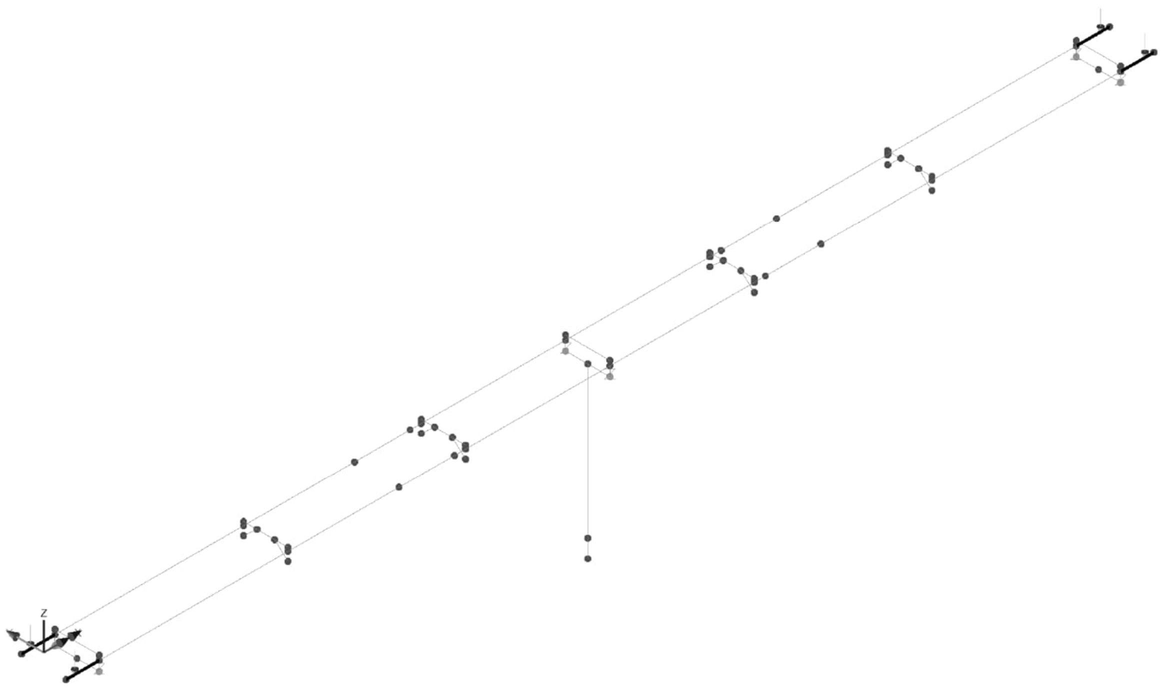


3.1.6 Vikt ändskärm (EGEN_1-4)

$$V_c = 0.80m \cdot 2.35m \cdot 2.0m = 3.8m^3$$

$$P_g = \gamma_c \cdot V_c = 25\frac{kN}{m^3} \cdot 3.8m^3 = 94kN$$





Load : EGEN 1-4-1

Structural loading : Internal beam point

Point load in Z direction (P_z) : -95 kN

Distance along local element : 0.4 m

Loadcase : EGEN_1-4

Analys : Stage I

Load : EGEN 1-4-2

Structural loading : Internal beam point

Point load in Z direction (P_z) : -95 kN

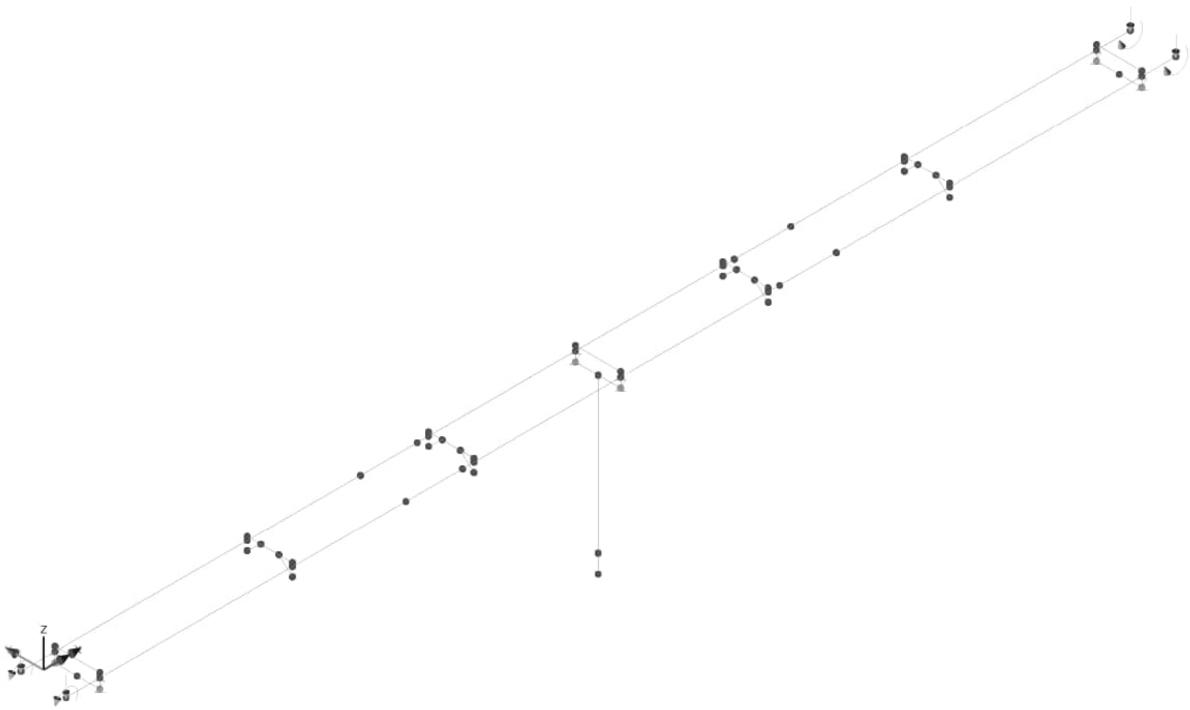
Distance along local element : 1.1 m

Loadcase : EGEN_1-4

Analys : Stage I

3.1.7 Vikt vingmur (EGEN_1-5)

Last av vingmurar påförs som punktlaster och tillhörande punktmoment vid respektive broände enligt redovisning nedan.



Stöd 1 :

$V_{c.1} = 2.5m \cdot 1.1m \cdot 0.40m = 1.10m^3$ och $e_1 = 1.25$ m

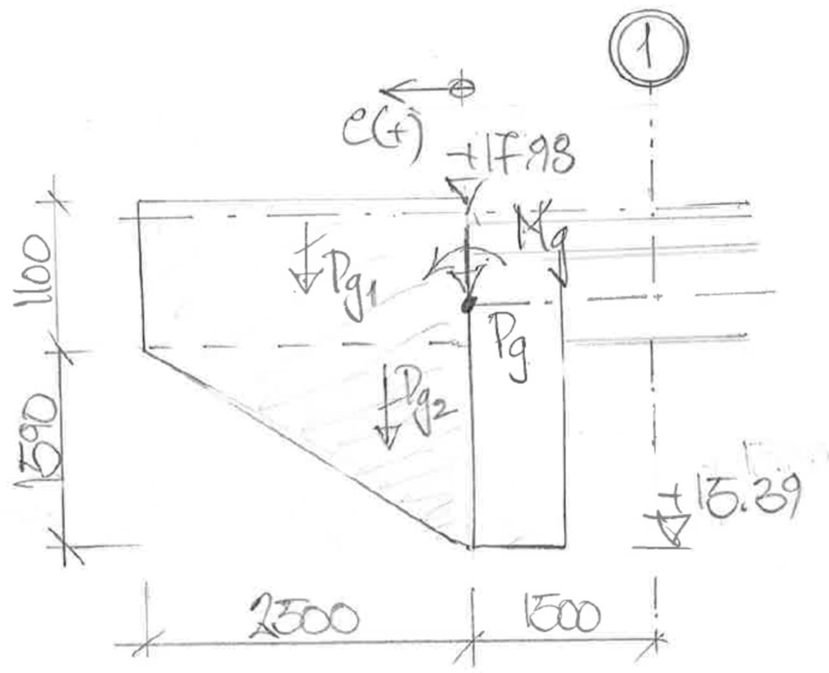
$V_{c.2} = 2.50m \cdot \frac{1.59m}{2} \cdot 0.40m = 0.80m^3$ och $e_2 = 0.83$ m

$$P_{g.1} = \gamma_c \cdot V_{c.1} = 25\frac{kN}{m^3} \cdot 1.1m^3 = 28kN$$

$$P_{g.2} = \gamma_c \cdot V_{c.2} = 25\frac{kN}{m^3} \cdot 0.80m^3 = 20kN$$

$$P_g = P_{g.1} + P_{g.2} = 48kN$$

$$M_g = P_{g.1} \cdot e_1 + P_{g.2} \cdot e_2 = 52kNm$$



Stöd 3 :

$V_{c.1} = 2.475m \cdot 1.1m \cdot 0.40m = 1.09m^3$ och e_1 = 1.24 m

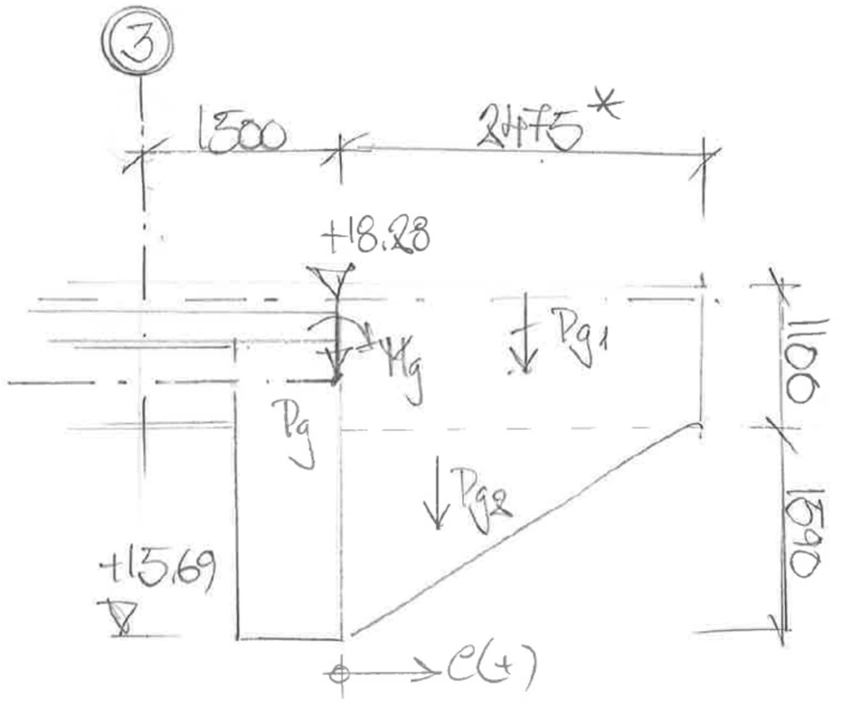
$V_{c.2} = 2.475m \cdot \dfrac{1.59m}{2} \cdot 0.40m = 0.79m^3$ och e_2 = 0.82 m

$$P_{g.1} = \gamma_c \cdot V_{c.1} = 25\frac{kN}{m^3} \cdot 1.09m^3 = 27kN$$

$$P_{g.2} = \gamma_c \cdot V_{c.2} = 25\frac{kN}{m^3} \cdot 0.79m^3 = 20kN$$

$$P_g = P_{g.1} + P_{g.2} = 47kN$$

$$M_g = P_{g.1} \cdot e_1 + P_{g.2} \cdot e_2 = 50kNm$$



$$* = \frac{2200 + 2750}{2} = 2475mm$$

Load : EGEN 1-5-1

Structural loading : Internal beam point

Point load in Z direction (P_z) : -48 kN

Point moment around Y direction (M_y) : -52 kNm

Distance along local element : 1.5 m

Loadcase : EGEN_1-5

Analys : Stage I

Load : EGEN 1-5-2

Structural loading : Internal beam point

Point load in Z direction (P_z) : -47 kN

Point moment around Y direction (M_y) : +50 kNm

Distance along local element : 0 m

Loadcase : EGEN_1-5

Analys : Stage I

3.1.8 Sammanställning egentyngd (EGEN)

Basic loadcomination EGEN_1 :

Loadcase	Factor
EGEN_1-1	1.00
EGEN_1-2	1.00
EGEN_1-3	1.00
EGEN_1-4	1.00
EGEN_1-5	1.00

Basic loadcomination EGEN :

Loadcase	Factor
EGEN 1	1.00
EGEN 2	1.00
EGEN 3	1.00

3.1.9 Vikt form (FORM+)

Bedömd vikt för formställning 0.50 kPa.

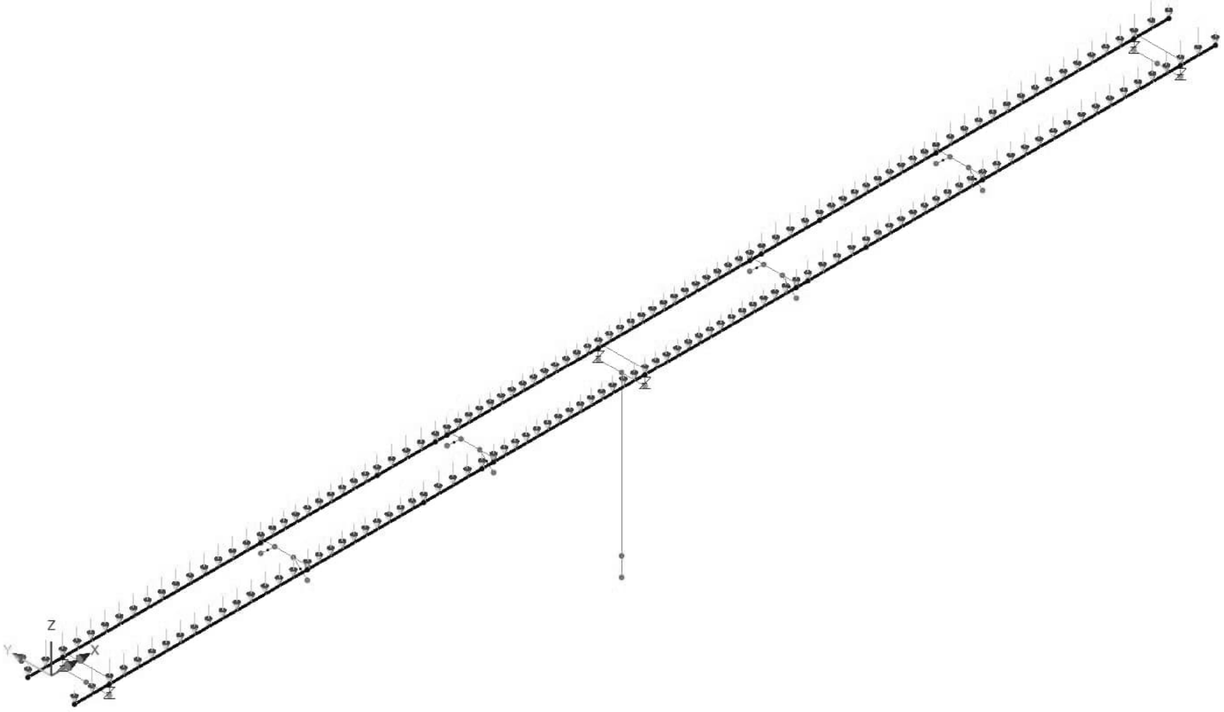
$$p_g = 0.50\frac{kN}{m^2}\cdot 2.0m = 1.0\frac{kN}{m}$$

Load : FORM+
Structural loading : Global distributed

Load per unit length in Z direction (p_z) : -1.0 $\frac{kN}{m}$

Loadcase : FORM+

Analys : Stage I

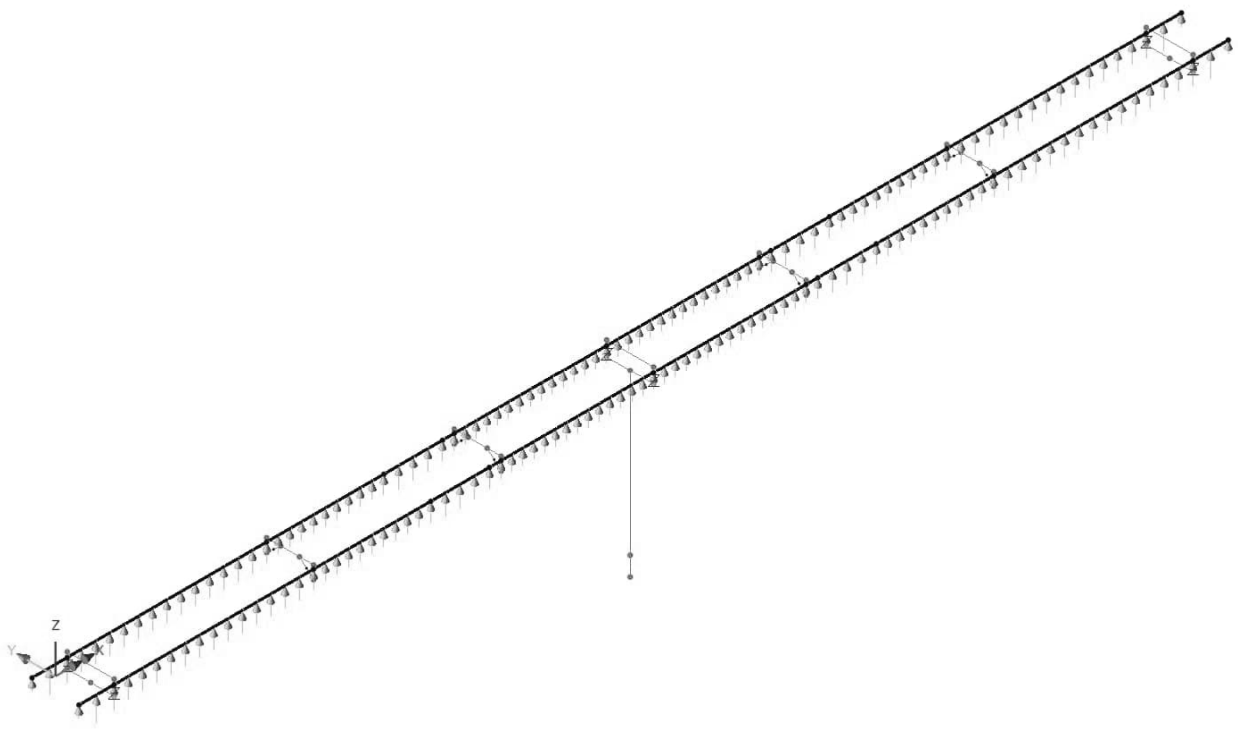


Load : FORM-
Structural loading : Global distributed

Load per unit length in Z direction (p_z) : +1.0 $\frac{kN}{m}$

Loadcase : FORM-

Analys : Drift-P



3.2 BELÄGGNING

Beläggning 75 mm PGJA på 5 mm tätskiktsmatta. En fiktiv last BELAGG anses även innehålla inverkan av räcke enligt redovisning nedan.

$$q_{bel} = \gamma_{PGJA} \cdot t + q_{matta} = 24\frac{kN}{m^3} \cdot 0.075m + 0.06kPa = 1.9\frac{kN}{m^2}$$

$$p_{bel} = q_{bel} \cdot b = 1.9\frac{kN}{m^3} \cdot 3.9m = 7.4\frac{kN}{m}$$

$$p_{räcke} = 2 \cdot 0.5\frac{kN}{m} = 1.0\frac{kN}{m}$$

$$\Rightarrow q_{BELAGG} = \frac{p_{bel} + p_{racke}}{4.0m} = 2.1\frac{kN}{m^2}$$

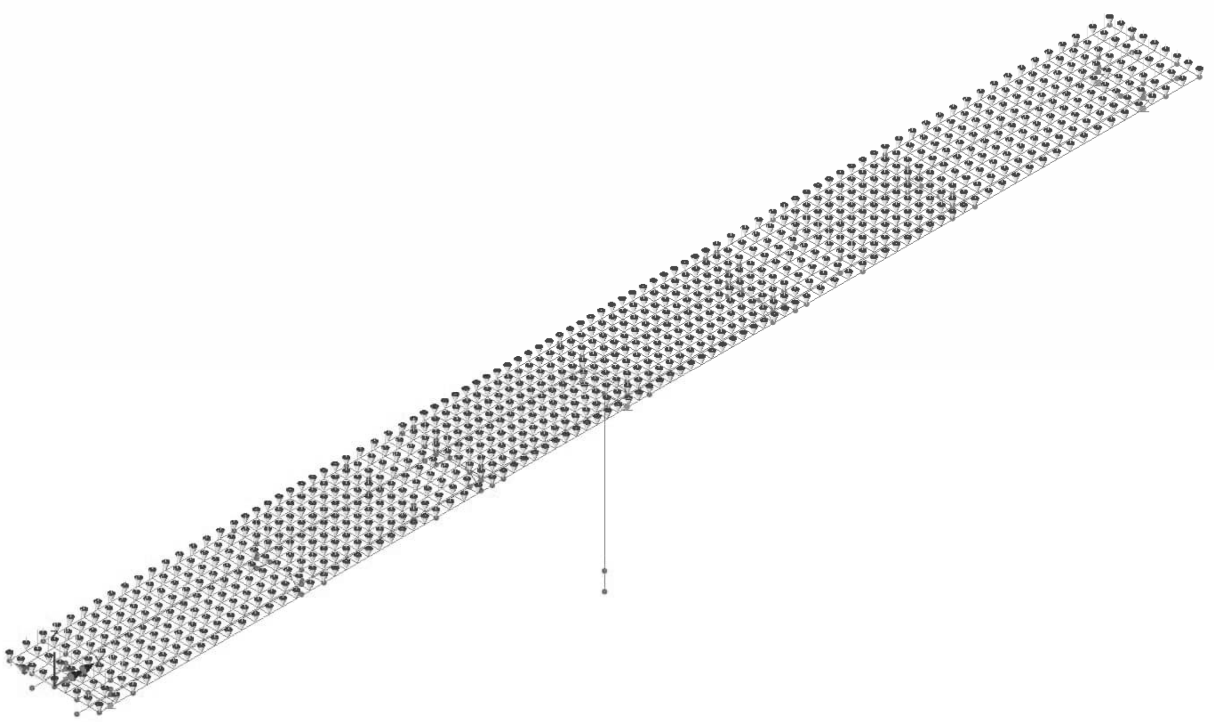
Load : BELAGG

Structural loading : Global distributed

Load per unit area in Z direction (q_z) : $-2.1\frac{kN}{m^2}$

Loadcase : BELAGG

Analys : Drift-P



3.3 JORDTRYCK

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

$\phi_{m.\phi} = 1.30$: SS-EN 1997-1 bilaga NA tabell A.4

$\phi_{m.E} = 1.20$: TK Geo CB.5

$$\gamma = 22\frac{kN}{m^3}$$

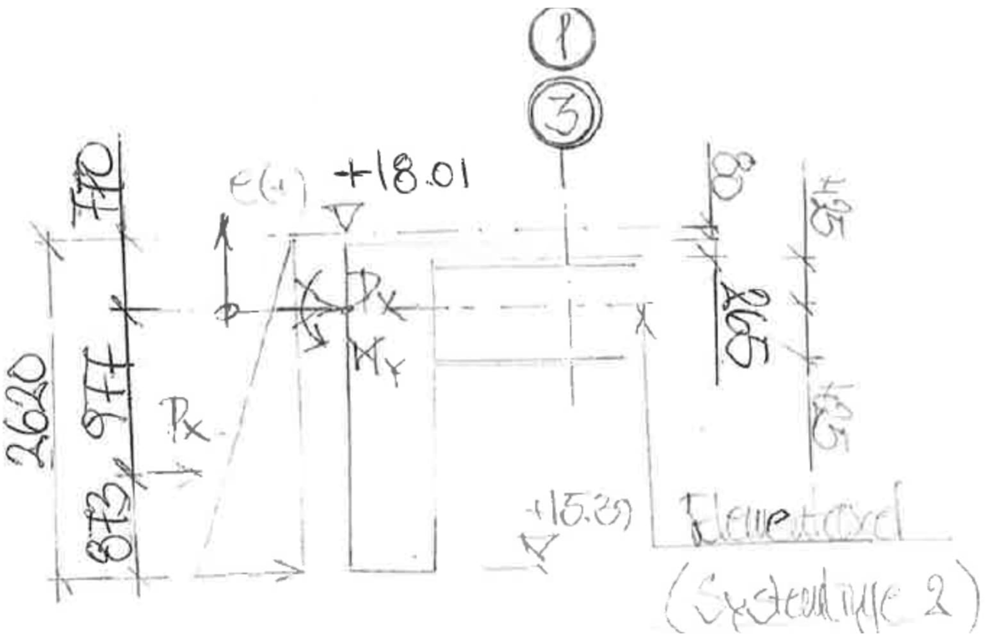
$$\gamma' = 13\frac{kN}{m^3}$$

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

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

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

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



3.3.1 Vilojordtryck (JORD)

$$q_x(s_1) = K_0 \cdot \gamma \cdot s_1 = 0.39 \cdot 22 \frac{kN}{m^3} \cdot s_1 = 8.6 \frac{kN}{m^3} \cdot s_1$$

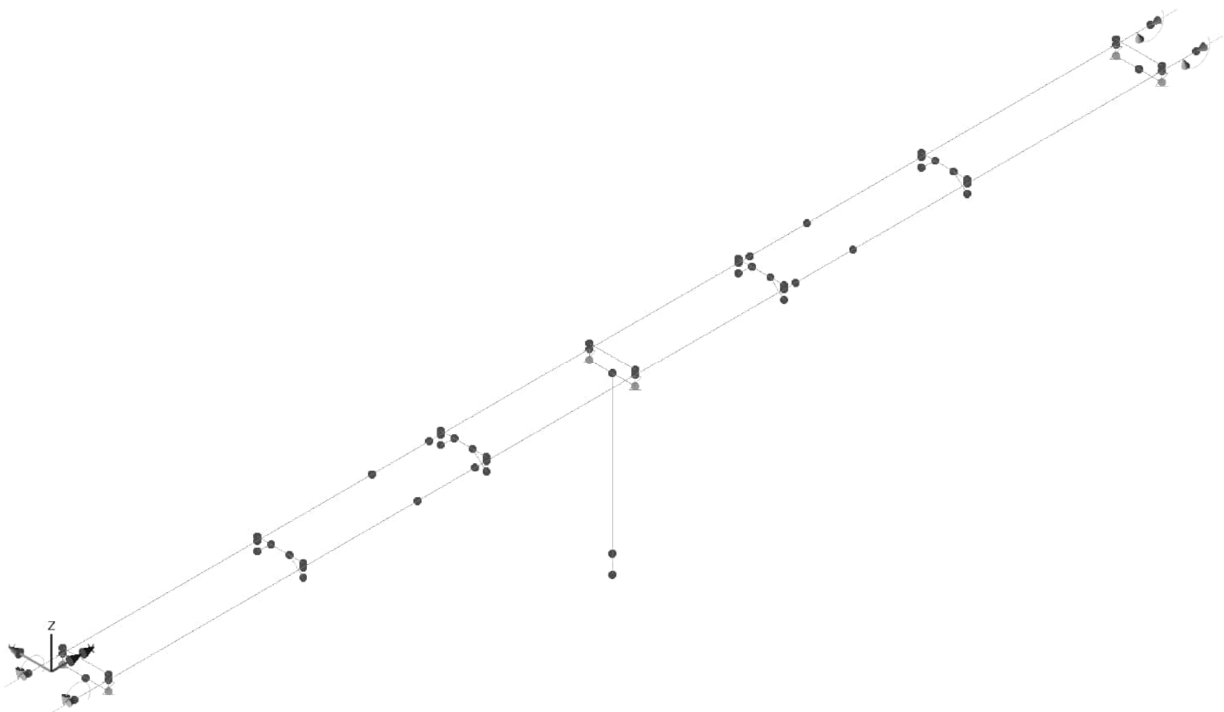
$$p_x(s_1) = B \cdot K_0 \cdot \gamma \cdot s_1 = 2.0m \cdot 0.39 \cdot 22 \frac{kN}{m^3} \cdot s_1 = 17.2 \frac{kN}{m^2} \cdot s_1$$

$$p_x(2.62m) = 17.2 \frac{kN}{m^2} \cdot 2.62m = 44.9 \frac{kN}{m}$$

$$P_x^{vilo} = 44.9 \frac{kN}{m} \cdot 2.62m \cdot \frac{1}{2} = 59kN$$

$$e = 0.98m$$

$$M_y^{vilo} = 59kN \cdot 0.98m = 58kNm$$



Load : JORD 1

Structural loading : Internal beam point

Point load in X direction (P_x) : +59 kN

Point moment around Y direction (M_y) : -58 kNm

Distance along local element : 0 m

Load position : About nodal line

Loadcase : JORD 1

Analys : Drift-P

Load : JORD 2

Structural loading : Internal beam point

Point load in X direction (P_x) : -59 kN

Point moment around Y direction (M_y) : +58 kNm

Distance along local element : +1.5 m

Load position : About nodal line

Loadcase : JORD 2

Analys : Drift-P

Basic loadcombination JORD :

Loadcase	Factor
JORD 1	1.00
JORD 2	1.00

3.3.2 Passivt jordtryck

$$P_x^{passiv} = \frac{K_p}{K_0} \cdot P_x^{vilo} = \frac{4.20}{0.39} \cdot 59kN = 635kN$$

3.4 STÖDFÖRSKJUTNING

Stödförskjutningen bestäms enligt TRVR Bro 11 avsnitt B.3.1.4.

Vertikal sättning differens stödsättning 10 mm anses uppträda.

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).

$s_d(stöd\_1) = 11mm$: sida C2:62

$s_k(stöd\_2) = 1mm$: sida C3:46

$$\Delta s_d = s_d(stöd\_1) - s_k(stöd\_2) = 10mm$$

3.4.1 Vertikal stödförskjutning

Load: STOD_1Z

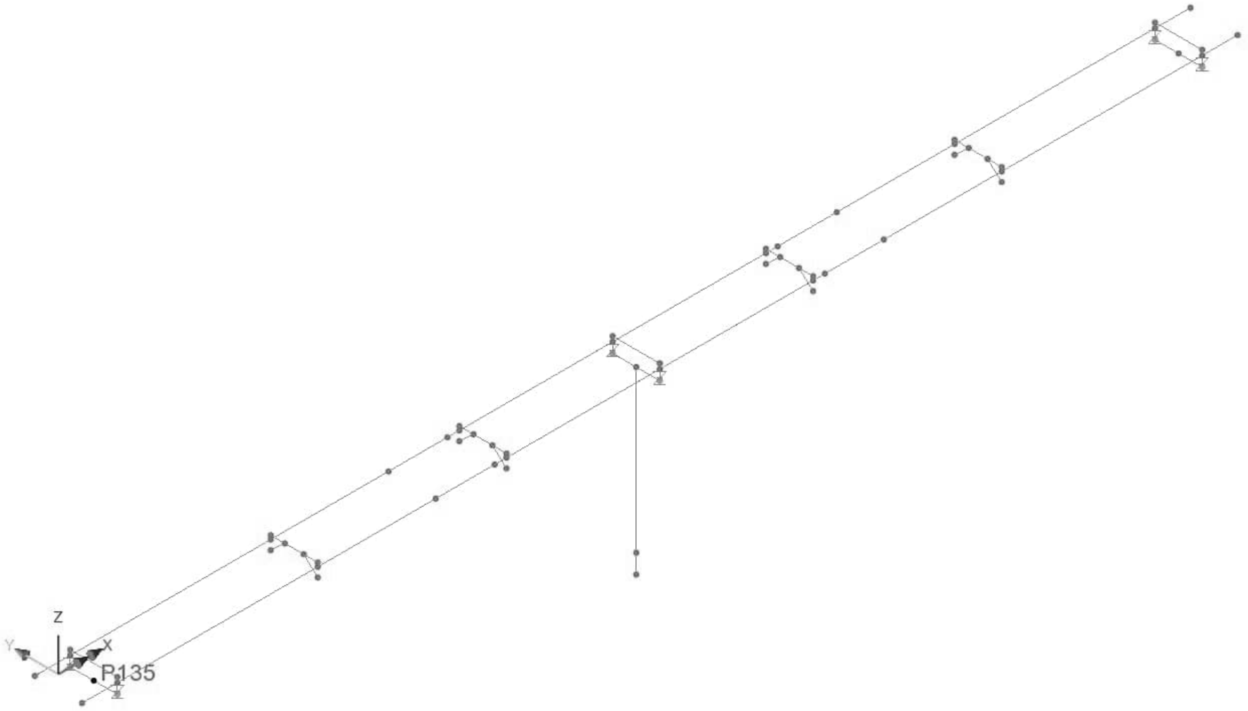
Structural loading : Perscribed Displacement

Translation at point in Z direction : -0.010 m

Loadcase : STOD_1Z

Point : P135

Analys : Drift-P



Load : STOD_2Z

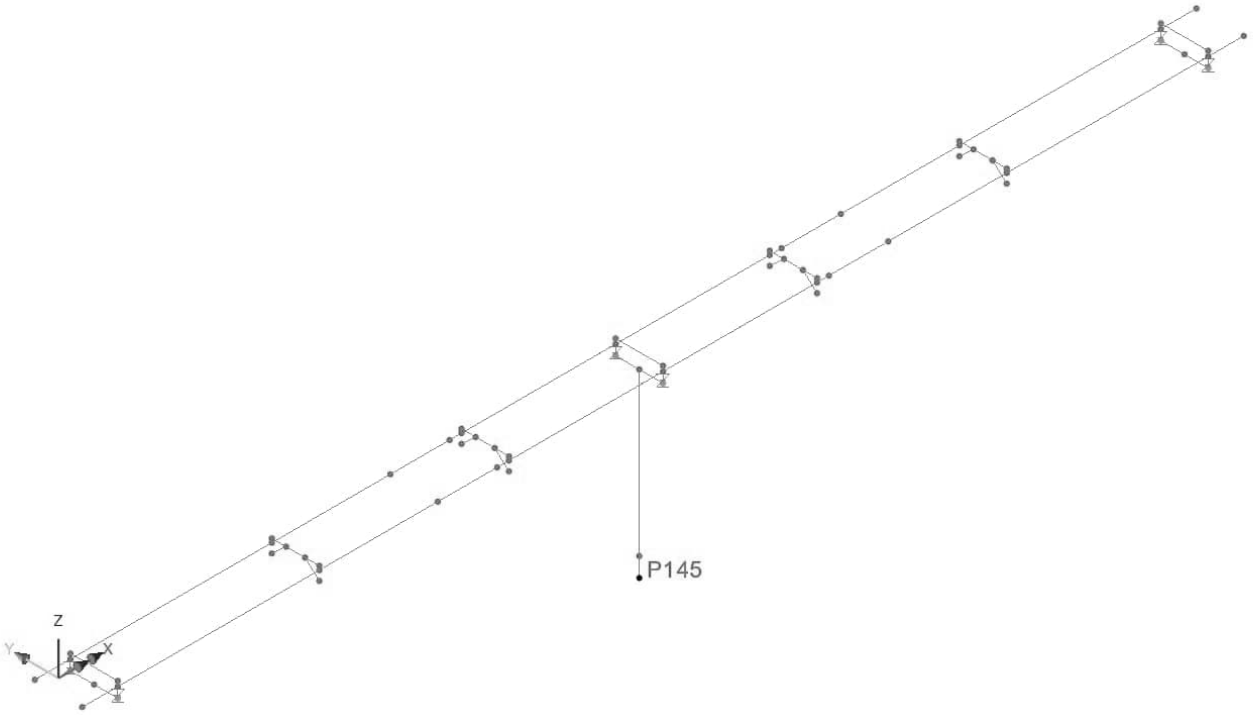
Structural loading : Perscribed Displacement

Translation at point in Z direction : -0.010 m

Loadcase : STOD_2Z

Point : P145

Analys : Drift-P



Load: STOD_3Z

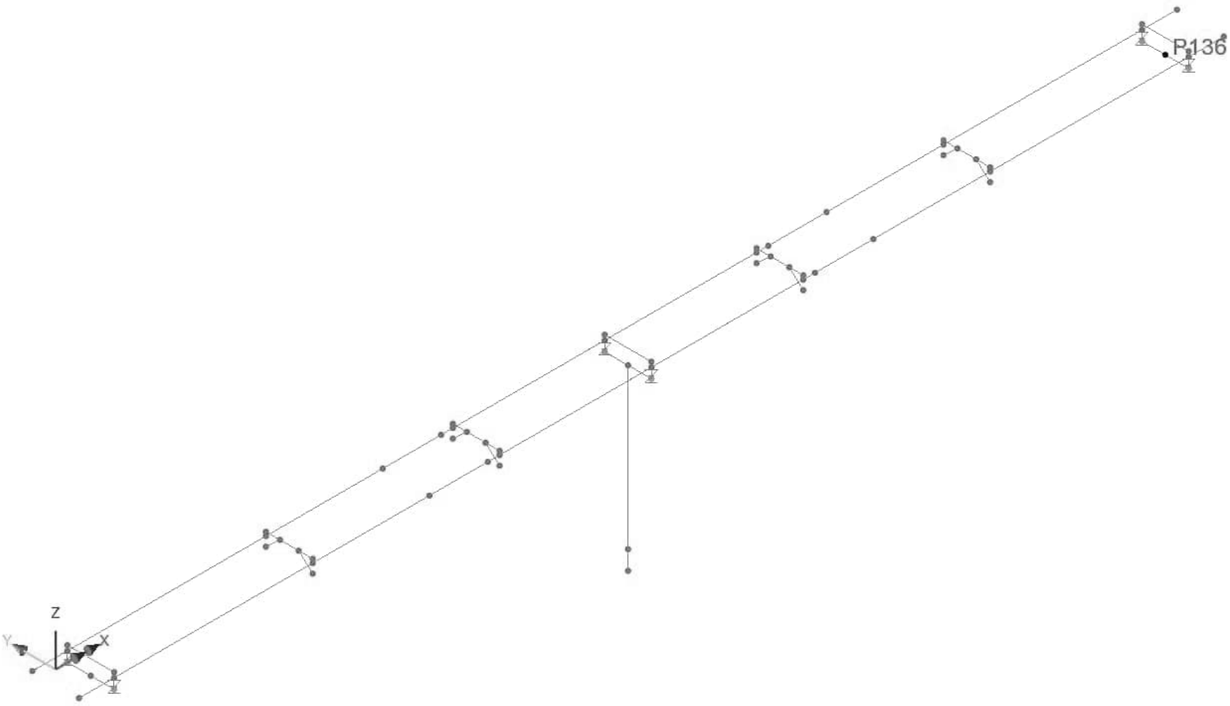
Structural loading : Perscribed Displacement

Translation at point in Z direction : -0.010 m

Loadcase : STOD_3Z

Point : P136

Analys : 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 : P135

Analys : Drift-P

Load : STOD_2Y

Structural loading : Perscribed Displacement

Translation at point in Z direction : 0.010 m

Loadcase : STOD_2Y+

Point : P145

Analys : Drift-P

Load : STOD_3Y

Structural loading : Perscribed Displacement

Translation at point in Z direction : 0.010 m

Loadcase : STOD_3Y+

Point : P136

Analys : 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.
249	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): $BTG = "C35/45"$

Relativ fuktighet : $RH = 80\%$

Tvärsnittetsbredd : $b = 3.9m$

Tvärsnittetshöjd : $h = 249mm$

Tvärsnittsarea : $A_c = b \cdot h = 0.97 \cdot m^2$

Omkrets i kontakt med "luft" : $u = 2 \cdot b = 7.8\,m$

Bärverkets ekvivalenta tjocklek : $h_0 = \dfrac{2 \cdot A_c}{u} = 0.249\,m$

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.

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

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

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

$$\varphi_{RH} = \begin{vmatrix} 1 + \dfrac{1 - RH}{0.1\sqrt[3]{\dfrac{h_0}{mm}}} & \text{if } f_{cm} \le 35\text{MPa} \\ \left(1 + \dfrac{1 - RH}{0.1\sqrt[3]{\dfrac{h_0}{mm}}}\cdot\alpha_1\right)\cdot\alpha_2 & \text{otherwise} \end{vmatrix} = 1.22$$

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

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

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

$$\beta_H = 778$$

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

$$\varphi_{t0} = \varphi_{RH}\cdot\beta_{fcm}\cdot\beta_0 = 2.12$$

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

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.

$t_s = 0dag$

$t_1 = 100år$

t	$\varepsilon_{cs}(t_1)$	Anm.
249	0.026	Sida A3:36
mm	%	-

Total krympning $\varepsilon_{cs}(t_1) = 0.026\%$ 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 : $b = 3.90m$

Tvärsnittetshöjd : $h = 0.249m$

Tvärsnittsarea : $A_c = b \cdot h = 0.97 \cdot m^2$

Omkrets i kontakt med "luft" : $u = 2 \cdot b = 7.8\,m$

Bärverkets ekvivalenta tjocklek : $h_0 = \dfrac{2 \cdot A_c}{u} = 0.249\,m$

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

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)

$$\alpha_{ds1} = \left| \begin{array}{l} 3.0 \text{ if } Klass = \text{"S"} \\ 4.0 \text{ if } Klass = \text{"N"} \\ 6.0 \text{ if } Klass = \text{"R"} \end{array} \right. = 4.00$$

$$\alpha_{ds2} = \left| \begin{array}{l} 0.13 \text{ if } Klass = \text{"S"} \\ 0.12 \text{ if } Klass = \text{"N"} \\ 0.11 \text{ if } Klass = \text{"R"} \end{array} \right. = 0.12$$

$$RH_o = 100 \cdot \%$$

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

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

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

$$k_h = \text{linterp}\left[\left(0 \ \ 100 \ \ 200 \ \ 300 \ \ 500 \ \ 10^4 \right) mm^T, \left(1.00 \ \ 1.00 \ \ 0.85 \ \ 0.75 \ \ 0.70 \ \ 0.70 \right)^T, h_0 \right] = 0.80$$

$$\beta_{ds} = \frac{t_1 - t_s}{t_1 - t_s + 0.04 \sqrt{\left(\frac{h_0}{mm} \right)^3}} = 1$$

$$\varepsilon_{cd} = \beta_{ds} \cdot k_h \cdot \varepsilon_{cd.0} = 0.02 \cdot \%$$

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

$$k_h = \text{linterp}\left[\left(0 \quad 100 \quad 200 \quad 300 \quad 500 \quad 10^4\right)\text{mm}^T, \left(1.00 \quad 1.00 \quad 0.85 \quad 0.75 \quad 0.70 \quad 0.70\right)^T, h_0\right] = 0.80$$

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

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

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

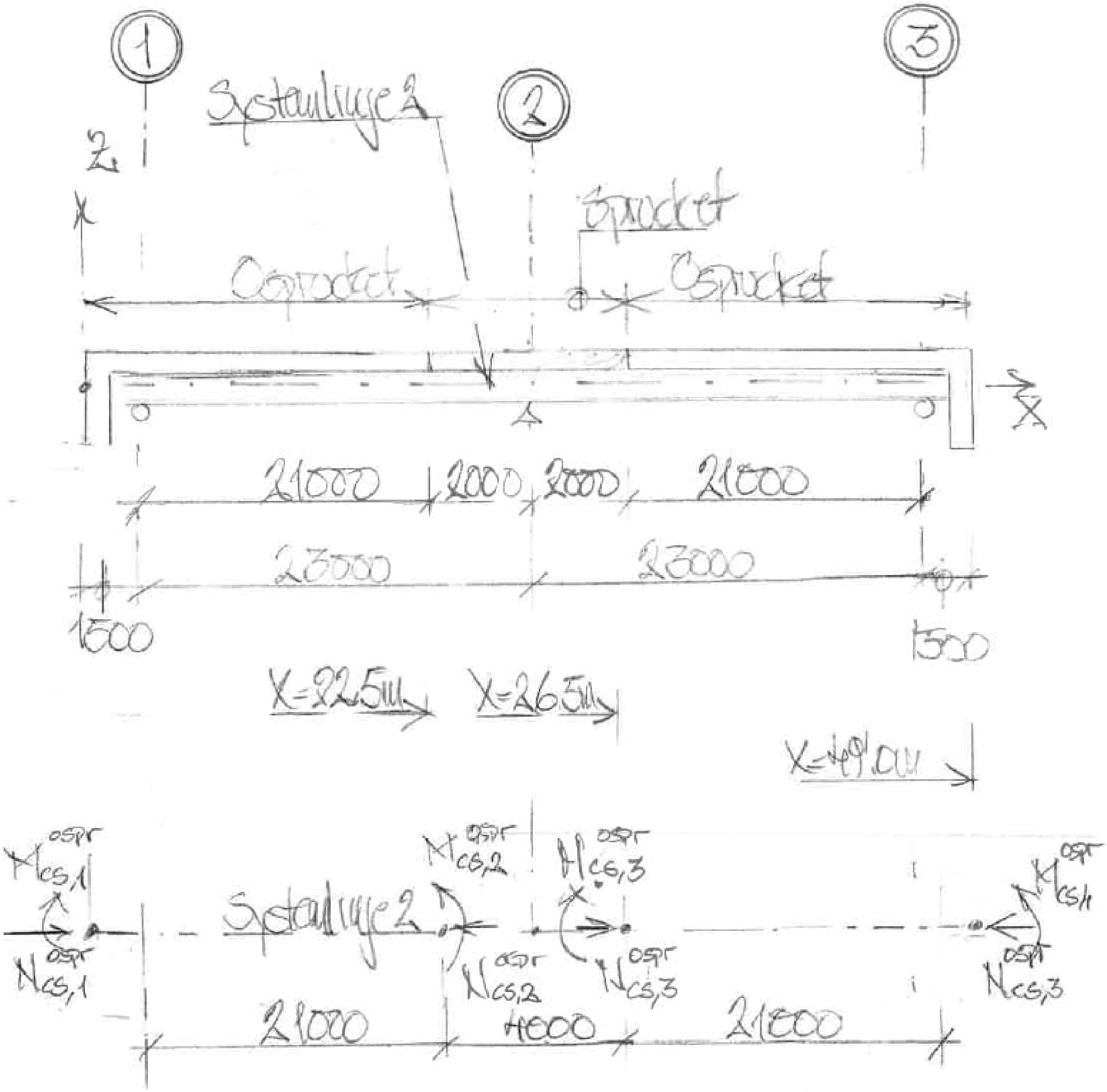
Total krympning (SS-EN 1992-1-1 avsnitt 3.1.4 ekv. 3.8)

$$\varepsilon_{cs} = \varepsilon_{cd} + \varepsilon_{ca} = 0.026\cdot\%$$

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 Systemlinje 2.



3.6.1.1 Segment A(C)

Osprucken betong (KRYMP-1 och KRYMP-4) :

$$N_{cs}^{ospr}(t_1) = -\varepsilon_{cs}(t_1) \cdot \frac{E_{cm}}{1+\psi_L \cdot \varphi_{t1}} \cdot A_c = -0.26 \cdot 10^{-3} \cdot \frac{34 \cdot 10^6 kPa}{1+0.55 \cdot 2.10} \cdot 0.486 m^2 = -1994 kN$$

$y_{tp} = +0.140m$: tyngdpunkt för betongfarbana, se sida A2:59

$y_{sam} = -0.096m$: samverkanstvärsnitt typ 3, se sida A2:84

$$M_{cs}^{ospr}(t_1) = -N_{cs}^{ospr}(t_1) \cdot (y_{tp} - y_{sam}) = 1994 kN \cdot (0.140m + 0.096m) = 470 kNm$$

Sprucken betong :

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

3.6.1.2 Segment B

Osprucken betong (KRYMP-2 och KRYMP-3) :

$$N_{cs}^{ospr}(t_1) = -\varepsilon_{cs}(t_1) \cdot \frac{E_{cm}}{1+\psi_L \cdot \varphi_{t1}} \cdot A_c = -0.26 \cdot 10^{-3} \cdot \frac{34 \cdot 10^6 kPa}{1+0.55 \cdot 2.10} \cdot 0.486 m^2 = -1994 kN$$

$y_{tp} = +0.140m$: tyngdpunkt för betongfarbana, se sida A2:59

$y_{sam} = -0.123m$: samverkanstvärsnitt typ 3, se sida A2:84

$$M_{cs}^{ospr}(t_1) = -N_{cs}^{ospr}(t_1) \cdot (y_{tp} - y_{sam}) = 1994 kN \cdot (0.140m + 0.123m) = 524 kNm$$

Sprucken betong :

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

3.6.1.3 Definition laster

Load : KRYMP-1

Structural loading : Internal beam point

Point load in X direction (P_x) : 1994 kN

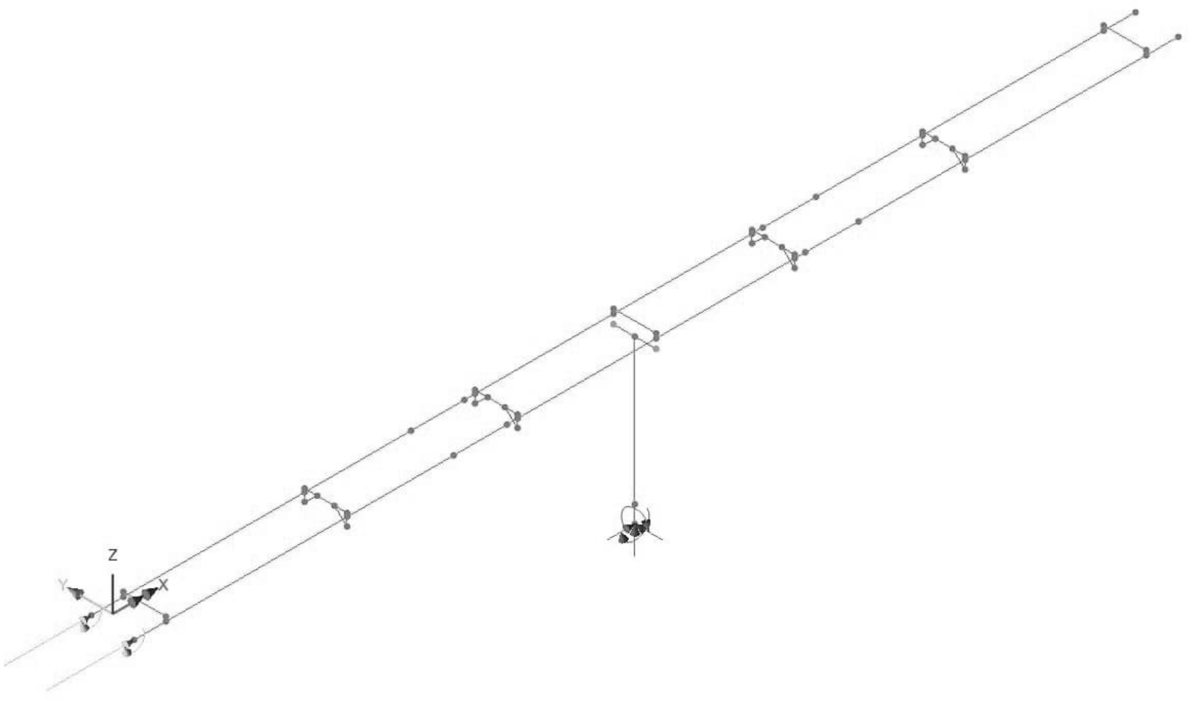
Point moment around Y direction (M_y) : +470 kNm

Distance along local element : 0 m

Load position : About beam axis

Loadcase : KRYMP-1

Analys : Drift-P



Load : KRYMP-2

Structural loading : Internal beam point

Point load in X direction (P_x) : -1994 kN

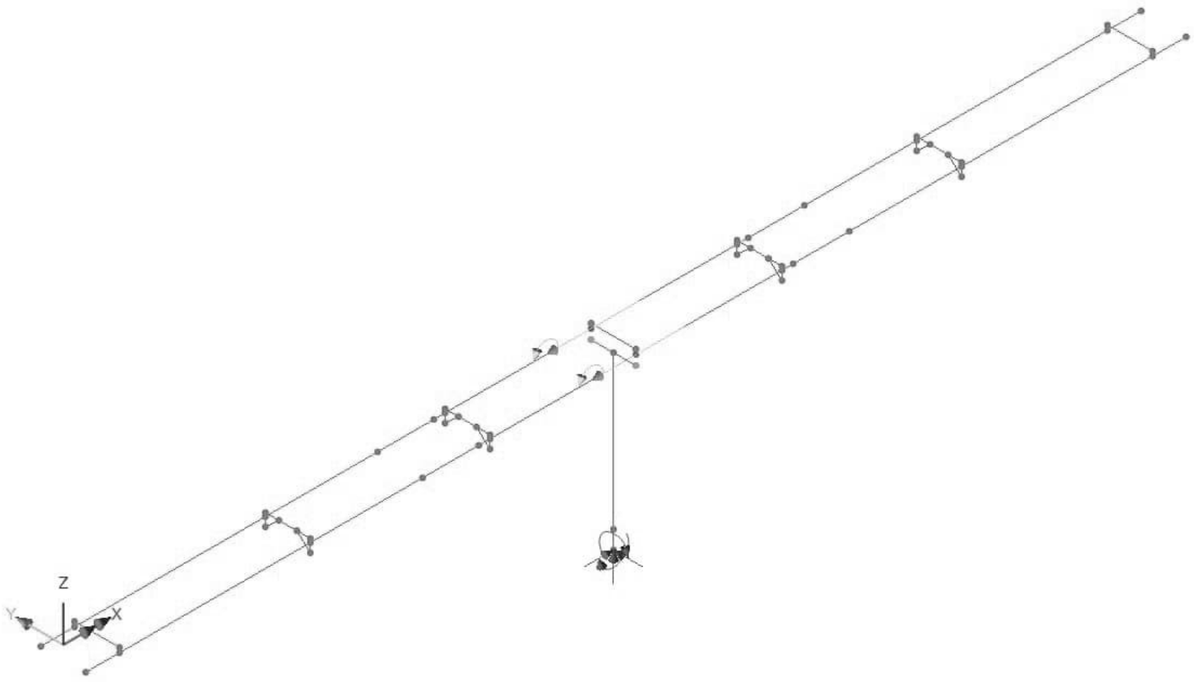
Point moment around Y direction (M_y) : -524 kNm

Distance along local element : 4.5 m

Load position : About beam axis

Loadcase : KRYMP-2

Analys : Drift-P



Load : KRYMP-3

Structural loading : Internal beam point

Point load in X direction (P_x) : 1994 kN

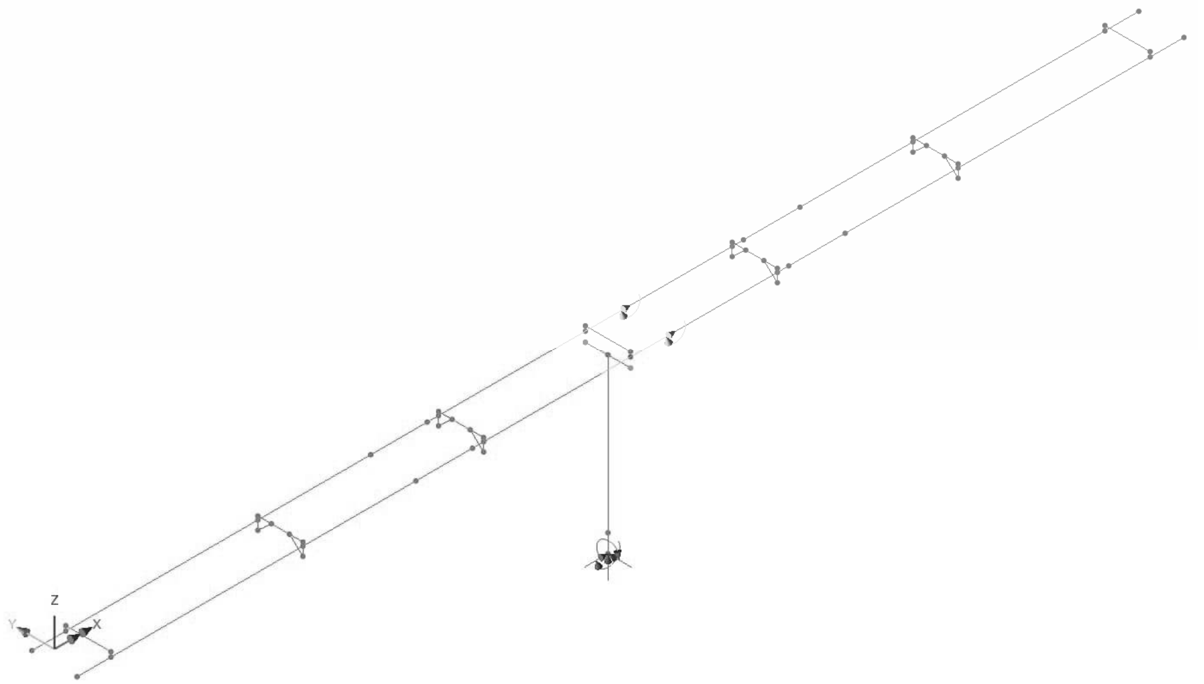
Point moment around Y direction (M_y) : +524 kNm

Distance along local element : 2.0 m

Load position : About beam axis

Loadcase : KRYMP-3

Analys : Drift-P



Load : KRYMP-4

Structural loading : Internal beam point

Point load in X direction (P_x) : -1994 kN

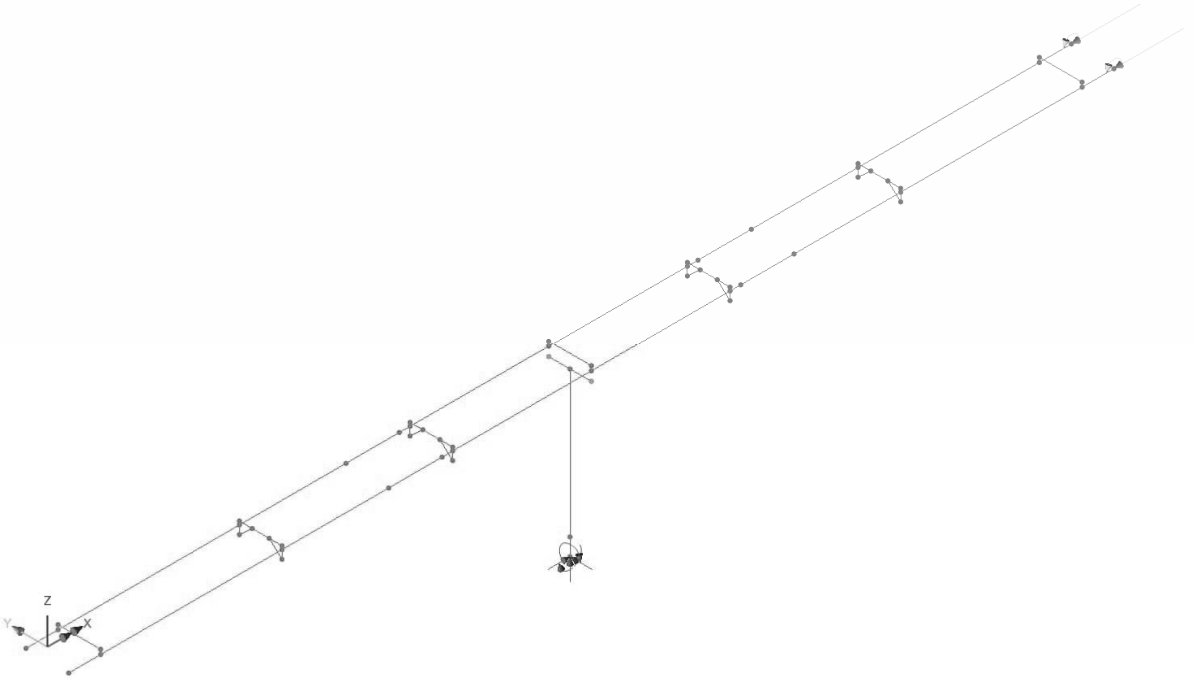
Point moment around Y direction (M_y) : -470 kNm

Distance along local element : 1.5 m

Load position : About beam axis

Loadcase : KRYMP-4

Analys : 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 GC-last sker enligt SS-EN 1991-2 kapitel 5 för totalt 3 st lastmodeller.

Lastmodell 1 utgörs av en ytlast enligt SS-EN 1991-2 avsnitt 5.3.2.1.

Lastmodell 2 utgörs av en godtyckligt placerad punktlast enligt SS-EN 1991-2 avsnitt 5.3.2.2.

Lastmodell 3 utgörs av renhållningsfordon enligt SS-EN 1991-2 avsnitt 5.3.2.3. Objektspecifikt renhållningsfordon utgörs av ett fordon motsvarande 100 % av olyckslast enligt SS-EN 1991-2 avsnitt 5.6.3.

3.7.1 Lastmodell 1 - ytlast

Lastmodellen utgörs av en ytlast enligt SS-EN 1991-2 avsnitt 5.3.2.1.

Utvärdering av godtyckligt placerad ytlast motsvarande $q_{ytlast} = 5kPa$ sker genom att införa totalt 16 st diskreta ytlaster enligt redovisning nedan. Dessa införs i den statiska modellen genom att föreskriva belastningsytan (*Search Area) DECK.*

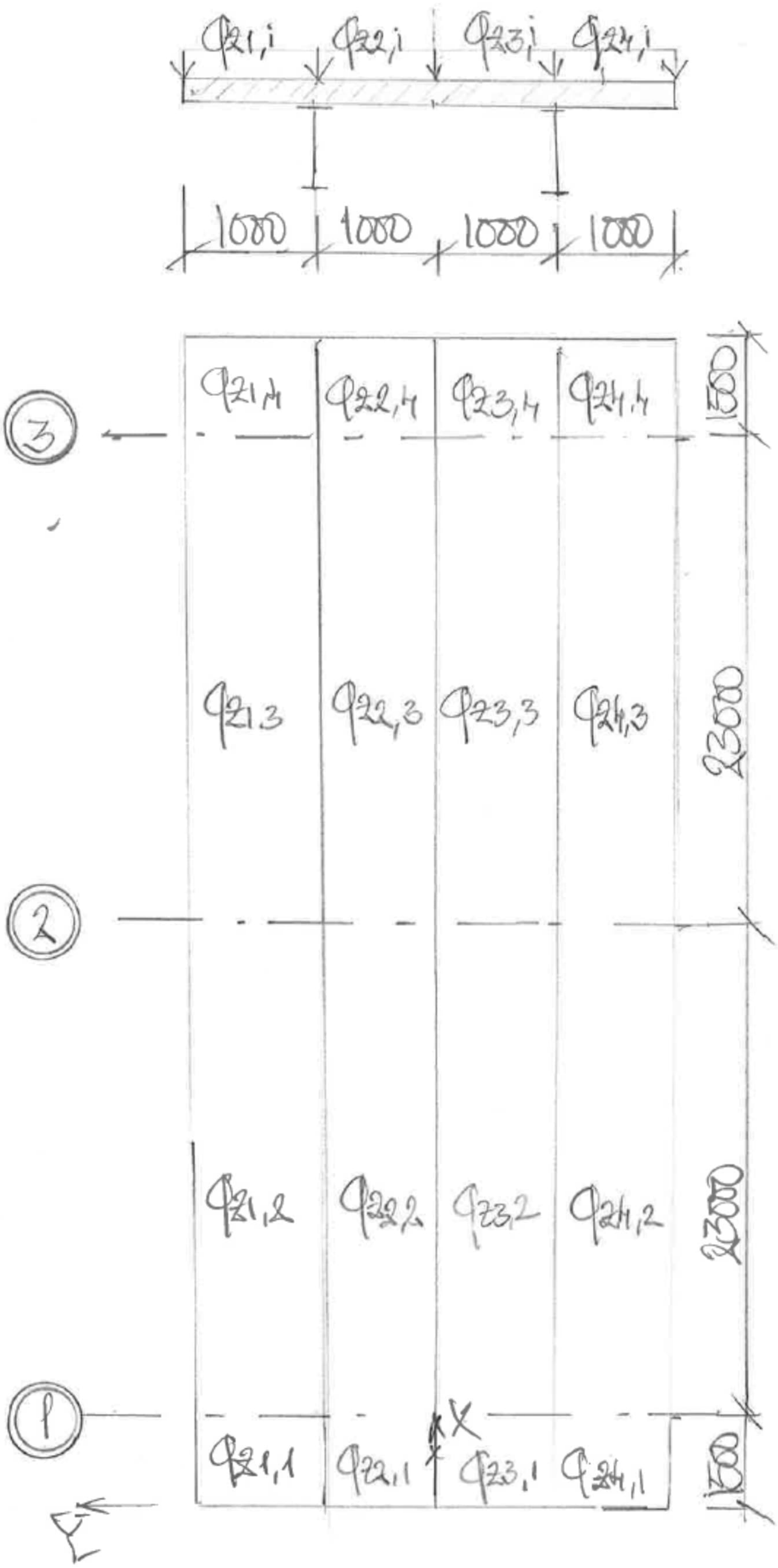
i = 1..4

$qz1_{,i}$ = 5 kPa

$qz2_{,i}$ = 5 kPa

$qz3_{,i}$ = 5 kPa

$qz4_{,i}$ = 5 kPa



q21,i
q22,i
q23,i
q24,i
1000
1000
1000
1000
q21,4
q22,4
q23,4
q24,4
1500
3
q21,3
q22,3
q23,3
q24,3
23000
2
q21,2
q22,2
q23,2
q24,2
23000
1
q21,1
q22,1
q23,1
q24,1
1500
X

Load : Ytlast 1-1

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	0	1.0	2.0	-5
2	1.5	1.0	2.0	-5
3	1.5	2.0	2.0	-5
4	0	2.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 1-1

Analys : Drift-V

Load : Ytlast 1-2

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	1.5	1.0	2.0	-5
2	24.5	1.0	2.0	-5
3	24.5	2.0	2.0	-5
4	1.5	2.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 1-2

Analys : Drift-V

Load : Ytlast 1-3

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	24.5	1.0	2.0	-5
2	47.5	1.0	2.0	-5
3	47.5	2.0	2.0	-5
4	24.5	2.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 1-3

Analys : Drift-V

Load : Ytlast 1-4

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	47.5	1.0	2.0	-5
2	49.0	1.0	2.0	-5
3	49.0	2.0	2.0	-5
4	47.5	2.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 1-4

Analys : Drift-V

Load : Ytlast 2-1

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	1.5	1.0	2.0	-5
2	0	1.0	2.0	-5
3	0	0	2.0	-5
4	1.5	0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 2-1

Analys : Drift-V

Load : Ytlast 2-2

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	1.5	1.0	2.0	-5
2	1.5	0	2.0	-5
3	24.5	0	2.0	-5
4	24.5	1.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 2-2

Analys : Drift-V

Load : Ytlast 2-3

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	47.5	1.0	2.0	-5
2	47.5	0	2.0	-5
3	24.5	0	2.0	-5
4	24.5	1.0	2.0	-5
-	M	m	m	kPa

Search area : DECK

Loadcase : Ytlast 2-3

Analys : Drift-V

Load : Ytlast 2-4

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	47.5	1.0	2.0	-5
2	49.0	1.0	2.0	-5
3	49.0	0	2.0	-5
4	47.5	0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 2-4

Analys : Drift-V

Load : Ytlast 3-1

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	1.5	-1.0	2.0	-5
2	0	-1.0	2.0	-5
3	0	0	2.0	-5
4	1.5	0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 3-1

Analys : Drift-V

Load : Ytlast 3-2

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	1.5	-1.0	2.0	-5
2	1.5	0	2.0	-5
3	24.5	0	2.0	-5
4	24.5	-1.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 3-2

Analys : Drift-V

Load : Ytlast 3-3

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	47.5	-1.0	2.0	-5
2	47.5	0	2.0	-5
3	24.5	0	2.0	-5
4	24.5	-1.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 3-3

Analys : Drift-V

Load : Ytlast 3-4

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	47.5	-1.0	2.0	-5
2	49.0	-1.0	2.0	-5
3	49.0	0	2.0	-5
4	47.5	0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 3-4

Analys : Drift-V

Load : Ytlast 4-1

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	1.5	-1.0	2.0	-5
2	0	-1.0	2.0	-5
3	0	-2.0	2.0	-5
4	1.5	-2.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 4-1

Analys : Drift-V

Load : Ytlast 4-2

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	1.5	-1.0	2.0	-5
2	1.5	-2.0	2.0	-5
3	24.5	-2.0	2.0	-5
4	24.5	-1.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 4-2

Analys : Drift-V

Load : Ytlast 4-3

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	47.5	-1.0	2.0	-5
2	47.5	-2.0	2.0	-5
3	24.5	-2.0	2.0	-5
4	24.5	-1.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 4-3

Analys : Drift-V

Load : Ytlast 4-4

Discrete loading : Patch 4 node

Node	X	Y	Z	q_z
1	47.5	-1.0	2.0	-5
2	49.0	-1.0	2.0	-5
3	49.0	-2.0	2.0	-5
4	47.5	-2.0	2.0	-5
-	m	m	m	kPa

Search area : DECK

Loadcase : Ytlast 4-4

Analys : Drift-V

Smart load combination GC-1 :

Loadcase	Permanent factor	Variable factor
Ytlast 1-1	0	1
Ytlast 1-2	0	1
Ytlast 1-3	0	1
Ytlast 1-4	0	1
Ytlast 2-1	0	1
Ytlast 2-2	0	1
Ytlast 2-3	0	1
Ytlast 2-4	0	1
Ytlast 3-1	0	1
Ytlast 3-2	0	1
Ytlast 3-3	0	1
Ytlast 3-4	0	1
Ytlast 4-1	0	1
Ytlast 4-2	0	1
Ytlast 4-3	0	1
Ytlast 4-4	0	1

3.7.2 Lastmodell 2 - punktlast

Lastmodellen utgörs av en godtyckligt placerad punktlast $P_{konc} = 10kN$ enligt SS-EN 1991-2 avsnitt 5.3.2.2 fördelad på en yta av 100 mm x 100 mm.

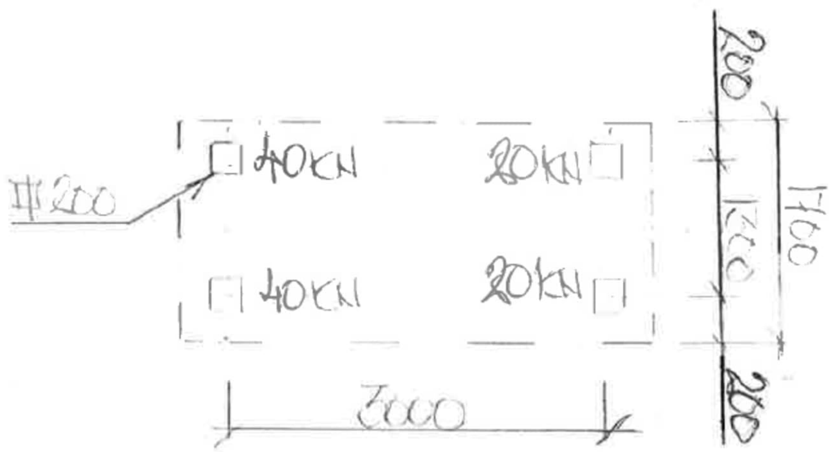
Detta ger upphov till en ekvivalent motsvarande $q_{ytlast} = \frac{P_{konc}}{A} = \frac{10kN}{0.1m \cdot 0.1m} = 1000kPa$

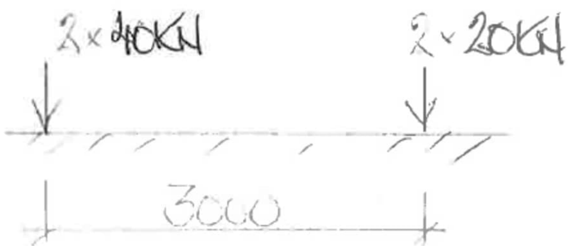
Lasten är endast dimensionerande lokalt och införes inte i systemberäkning.

3.7.3 Lastmodell 3 - renhållningsfordon

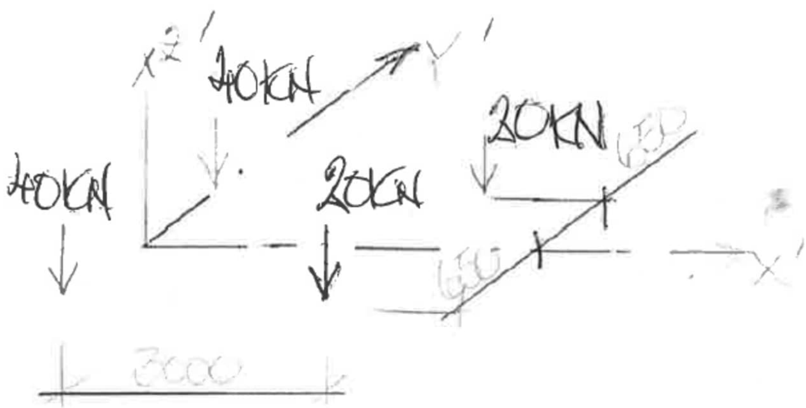
Lastmodellen utgörs av renhållningsfordon enligt SS-EN 1991-2 avsnitt 5.3.2.3 motsvaras av ett objektspecifikt fordon motsvarande 100 % av olyckslast enligt SS SS-EN 1991-2 avsnitt 5.6.3.

Fiktiva renhållningsfordon har en vikt motsvarande 12 ton med fördelningen enligt nedan.

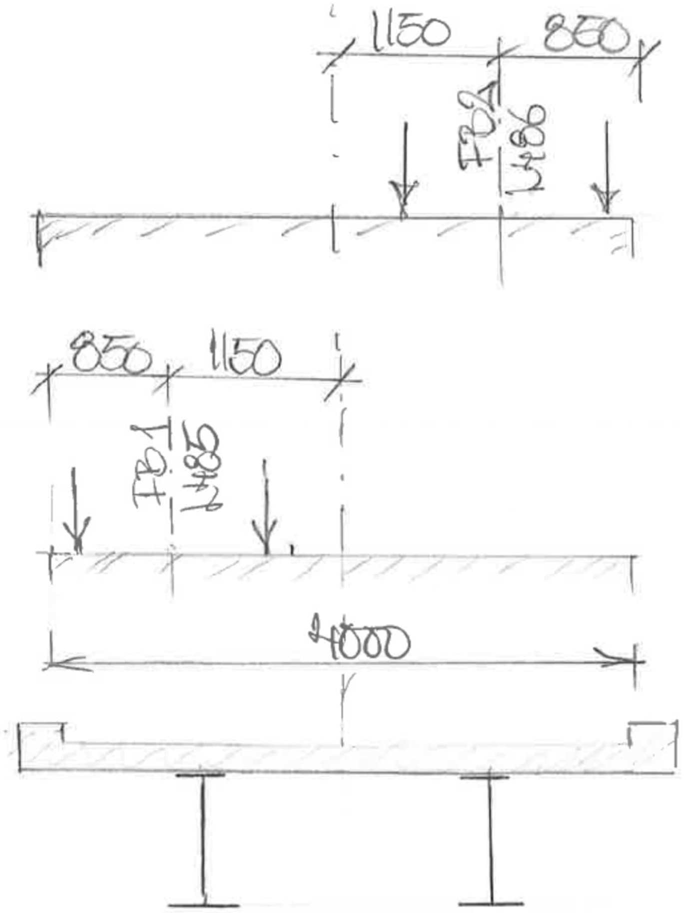




Lasten modelleras såsom 4 st diskreta punktlaster med princip utseende enligt figur nedan. Dessa införs i den statiska modellen genom att föreskriva belastningsytan *DECK*.



Renhållningsfordonet modelleras som en rörlig last utmed farbanor FB 1 och FB 2. Steglängden 0.50 m tillämpas.



Varje förflyttning ger upphov till ett lastfall. För att finna farligaste lastställning tillämpas enveloppet på de förekommande lasterna.

Load : Renhallning (attribute 42)

Discrete loading : Point load

Node	X	Y	Z	P_z
1	0	0.65	2.0	-40
2	0	-0.65	2.0	-40
3	3	0.65	2.0	-20
4	3	-0.65	2.0	-20
-	m	m	m	kN

Search area : DECK

Analys : Drift-V

Load attributes *:*

Load attribute nr	Load attribute
42	Renhallning

Loadcases *:*

Loadcase	Load attribute nr	Line	Farbana
1000..1105	42	485	FB1
2000..2105	42	486	FB2

Envelope *:*

Envelope	Loadcase
Renhallning-FB1	1000..1105
Renhallning-FB2	2000..2105

Envelope GC–3 *:*

Envelope
Renhallning: FB1
Renhallning: FB2

3.7.4 Kombinerade GC-last

Det förekommer totalt 3 st lastmodeller men endast lastmodell 1 och lastmodell 3 införes i systemberäkningen.

Envelope TRAFIK .:

Loadcase
GC-1
GC-3

3.8 BROMSKRAFT

Bromskraft bestäms enligt SS-EN 1991-2 §5.4.

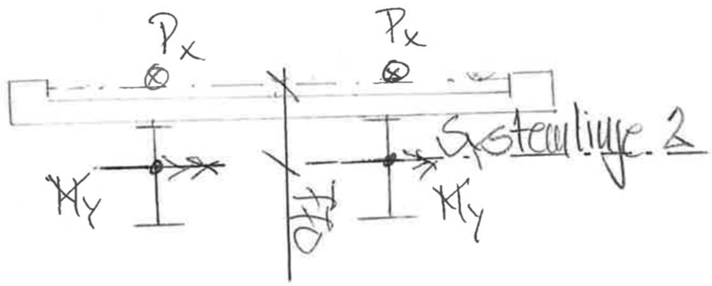
Lasten är uppträder parallellt bron i överkant beläggning. Lasten införes över stöd 2 enligt figur nedan.

$F_{broms.1} = 10\% \cdot (4.0m \cdot 5kPa \cdot 49.0m) = 98kN$: Lastmodell 1

$F_{broms.3} = 0.6 \cdot Q_{\mathrm{Re}nhåll} = 0.6 \cdot 120kN = 72kN$: Lastmodell 3

$$\Rightarrow P_x^{broms} = \pm \frac{F_{broms.1}}{2} = \pm \frac{98kN}{2} = \pm 49kN$$

$$M_y^{broms} = \pm P_x^{broms} \cdot 0.77m == \pm 39kNm$$



Load :Px = +49 kN

Structural loading : Concentrated

Concentrated load in X direction : +49 kN

Moment about Y axis : +39 kNm

Loadcase : Px = +49 kN

Analys : Drift-V

Load :Px = -49 kN

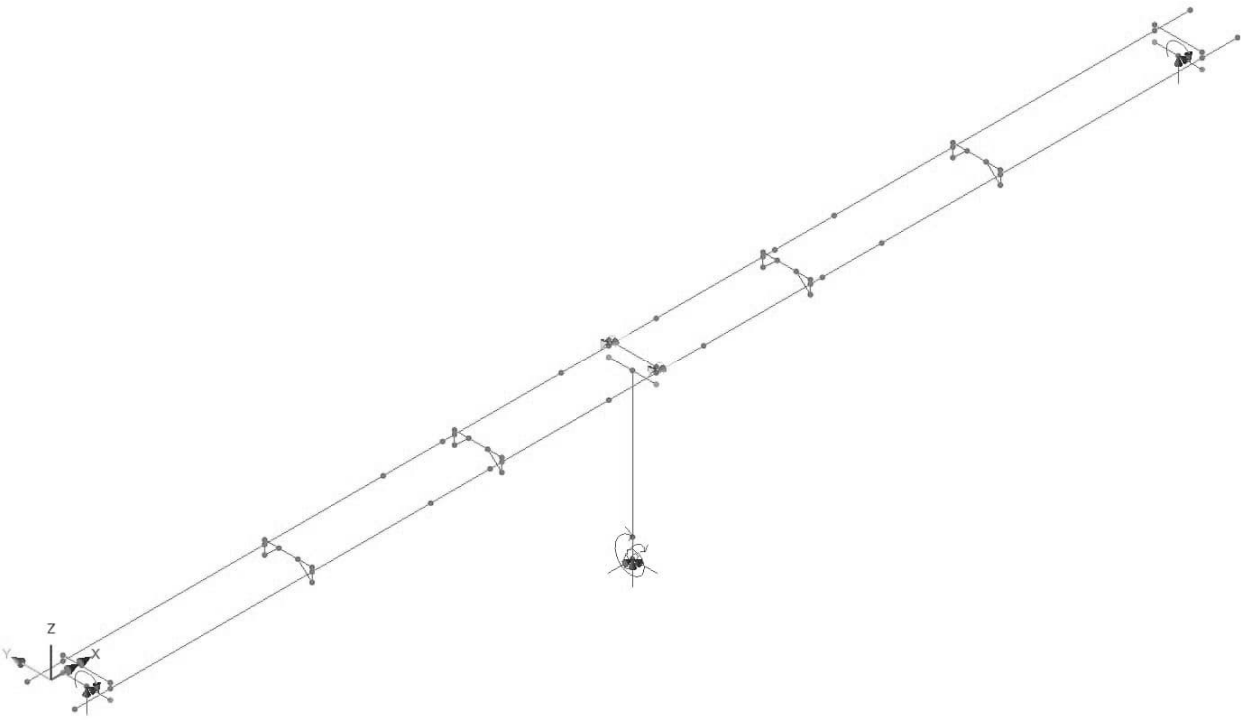
Structural loading : Concentrated

Concentrated load in X direction : -49 kN

Moment about Y axis : -39 kNm

Loadcase : Px = -49 kN

Analys : Drift-V



3.9 SIDOKRAFT

Om sidokraften bestäms enligt SS-EN 1991-2 §4.4.2 så erhålles en försumbar sidokraft enligt redovisning nedan. Ingen bromslast anses uppträda av jämnt fördelad vertikallast.

$Q_{tk} = 0.25Q_{lk} = 0.25 \cdot 72kN = 18kN$: sned inbromsning

3.10 ÖVERLAST

Överlast bestäms enligt SS-EN 1991-2 avsnitt 5.9 enligt redovisning nedan :

$q_{ytlast} = 5kPa$: vertikal belastning

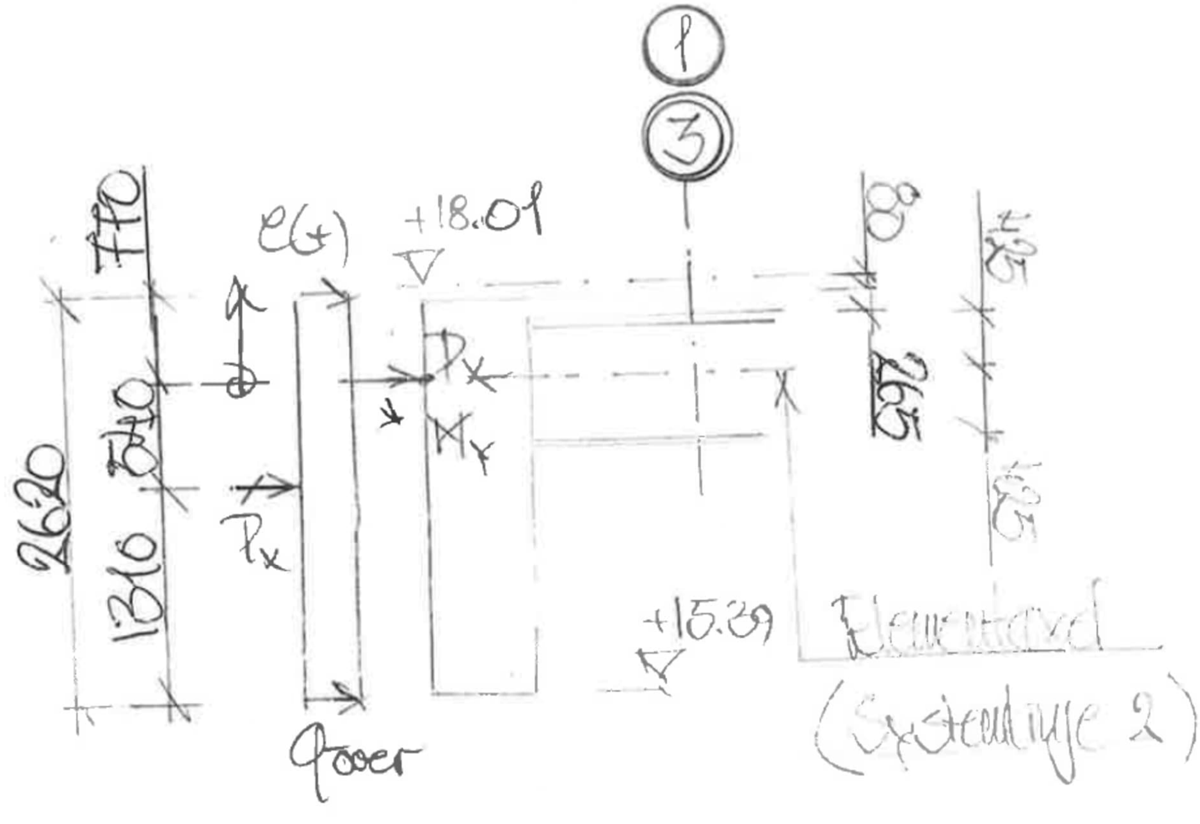
$q_{över} = K_0 \cdot q_{ytlast} = 0.39 \cdot 5kPa = 2kPa$: horisontell belastning

$$p_x = B \cdot q_{över} = 2.0m \cdot 2kPa = 4\frac{kN}{m}$$

$$P_x = 4\frac{kN}{m} \cdot 2.62m = 11kN$$

$$e = 0.54m$$

$$M_y = 11kN \cdot 0.54m = 6kNm$$



<u>Anm</u>. På säker sida tillämpas dock $q_{ytlast} = 5kPa$ med anledning av utryckningsfordon uppe på motfyllning, se även SS-EN 1992-2 avsnitt 2.9 anmärkning 1.

Load : OVER-1

Structural loading : Internal beam point

Point load in X direction (P_x) : +11 kN

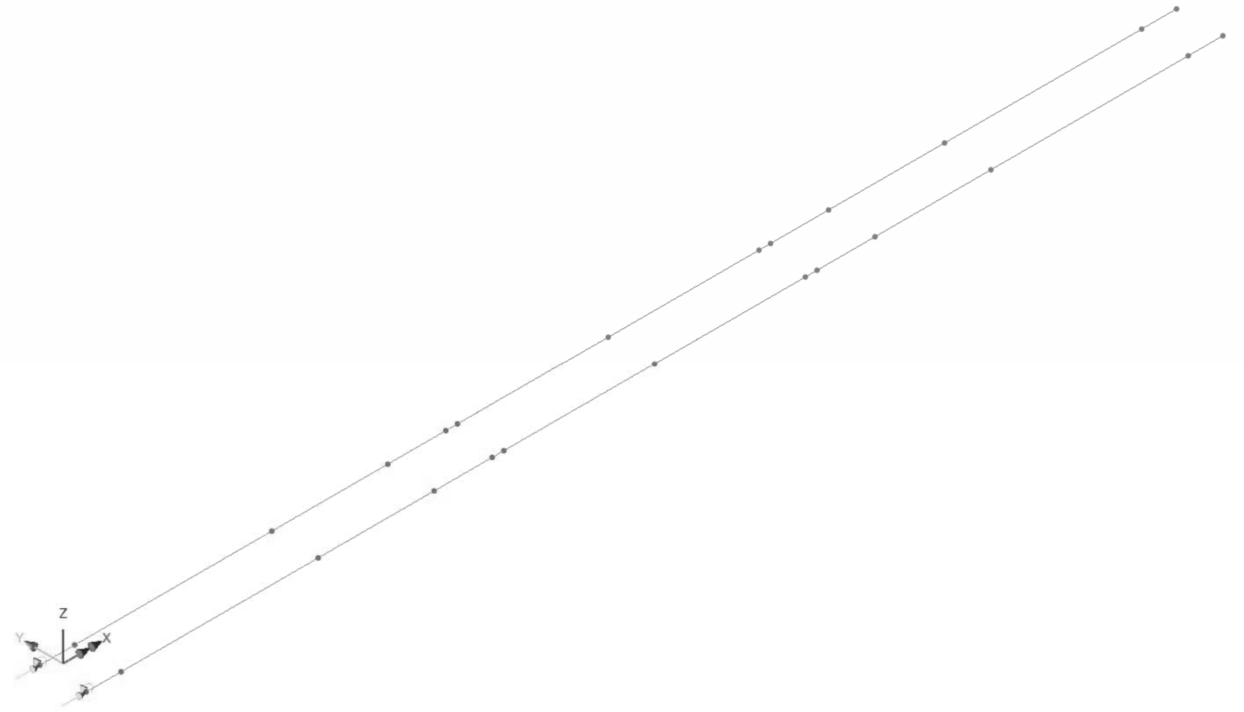
Point moment around Y direction (M_y) : -6 kNm

Distance along local element : 0 m

Load position : About nodal line

Loadcase : OVER-1

Analys : Drift-V



Load : OVER-2

Structural loading : Internal beam point

Point load in X direction (P_x) : -11 kN

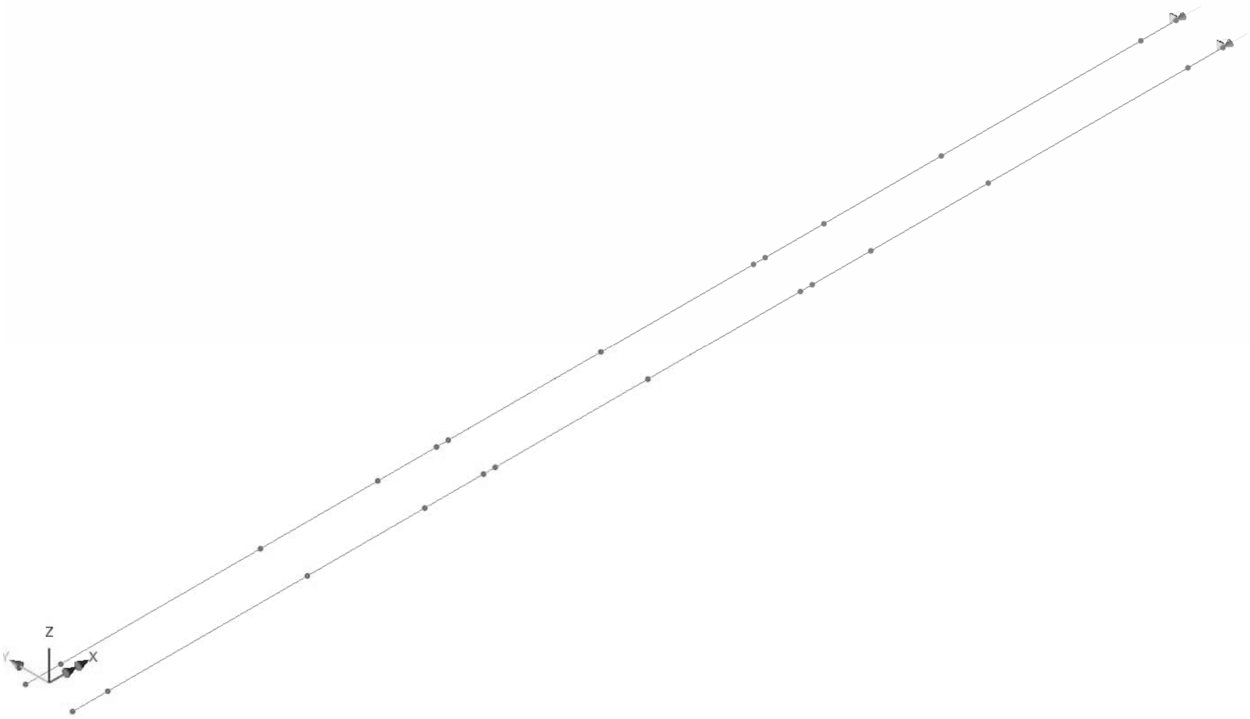
Point moment around Y direction (M_y) : +6 kNm

Distance along local element : +1.5 m

Load position : About nodal line

Loadcase : OVER-2

Analys : Drift-V



3.11 TEMPERATUR

Temperaturpåverkan på broar anges i TRVK Bro 11 avsnitt B.3.2.5 och EN 1991-1-5 kapitel 6.

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).

Inverkan behöver ej beaktas i brottgränstillstånd enligt SS-EN 1992-1-1 §2.3.1.2. Om så sker får en reducerad styvhet tillämpas enligt SS-EN 1992-1-1 §5.4(3).

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

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

Betongplatta $\Rightarrow$ typ 2

Ort : Täby

$T_{\max} = +36°C$: BFS 2013:10 EKS 9 Tabell C-11

$T_{\min} = -33°C$: BFS 2010:10 EKS 9 Tabell C-11

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 endast upphov till translation i längsled. Bron har dock försetts med ändskärmar vilket gör att ett förhöjt jordtryck uppträder vid rörelse. Även de fasta lagren ger upphov till tvångskrafter.

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

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

$$T_{e.max} = T_e(T_{max}) = 40\,°C$$

$$T_{e.min} = T_e(T_{min}) = -29\,°C$$

$$T^+ = T_{e.\max} - T_0 = +40°C - 10°C = +30°C$$

$$T^- = T_{e.\min} - T_0 = -29°C - 10°C = -39°C$$

$$\Rightarrow \delta = \Delta T \cdot \alpha \cdot \frac{L}{2} = (30^o C + 39^o C) \cdot 1.2 \cdot 10^{-5} \cdot \frac{49000}{2} = 24mm$$

3.11.2 Ojämn temperatur mellan konstruktionsdelar i sammanssatt tvärsnitt (OJTEMP)

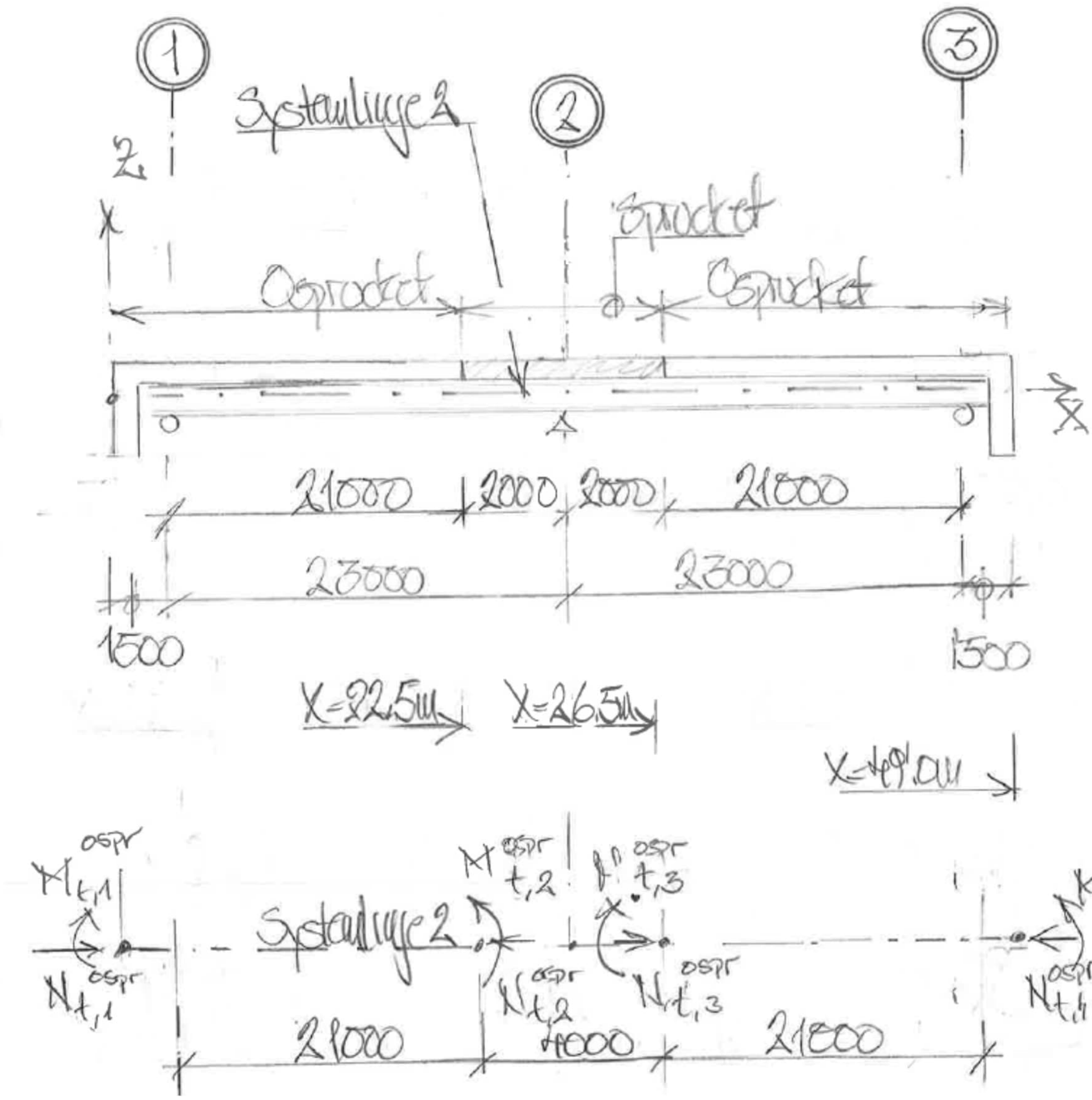
Linjär temperaturskillnad över tvärsnitt bestäms enligt EN 1991-1-5 § 6.1.4.2. Det förenklade förfarandet tillämpas tillhörande broöverbyggnad typ 2 (samverkansbro).

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

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

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 Systemlinje 2.



3.11.1.1 Segment A(C)

Osprucken betong (OJTEMP-1 och OJTEMP-4) :

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

$A_c = 0.486m^2$: se sida A2:59

$$N_t^{ospr} = \pm\alpha \cdot \frac{E_{cm}}{1+\varphi_t} \cdot \Delta T \cdot A_c = \pm 10^{-5} \cdot \frac{34 \cdot 10^6 kPa}{1+0} \cdot 10°C \cdot 0.486m^2 = \pm 1652kN$$

$y_{tp} = +0.140m$: tyngdpunkt för betongfarbana, se sida A2:59

$y_{sam} = -0.004m$: samverkanstvärsnitt typ 7, se sida A2:84

$$M_t^{ospr} = \pm N_t^{ospr} \cdot (y_{tp} - y_{sam}) = \pm 1652kN \cdot (0.140m + 0.004m) = \pm 238kNm$$

Sprucken betong :

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

3.11.1.2 Segment B

Osprucken betong (OJTEMP-2 och OJTEMP-3) :

$$N_t^{ospr} = \pm\alpha \cdot \frac{E_{cm}}{1+\varphi_t} \cdot \Delta T \cdot A_c = \pm 10^{-5} \cdot \frac{34 \cdot 10^6 kPa}{1+0} \cdot 10°C \cdot 0.486m^2 = \pm 1652kN$$

$y_{tp} = +0.140m$: tyngdpunkt för betongfarbana, se sida A2:59

$y_{sam} = -0.022m$: samverkanstvärsnitt typ 7, se sida A2:84

$$M_t^{ospr} = \pm N_t^{ospr} \cdot (y_{tp} - y_{sam}) = \pm 1652kN \cdot (0.140m + 0.022m) = \pm 268kNm$$

Sprucken betong :

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

3.11.1.3 Definition laster

Load : OJTEMP-1

Structural loading : Internal beam point

Point load in X direction (P_x) : 1652 kN

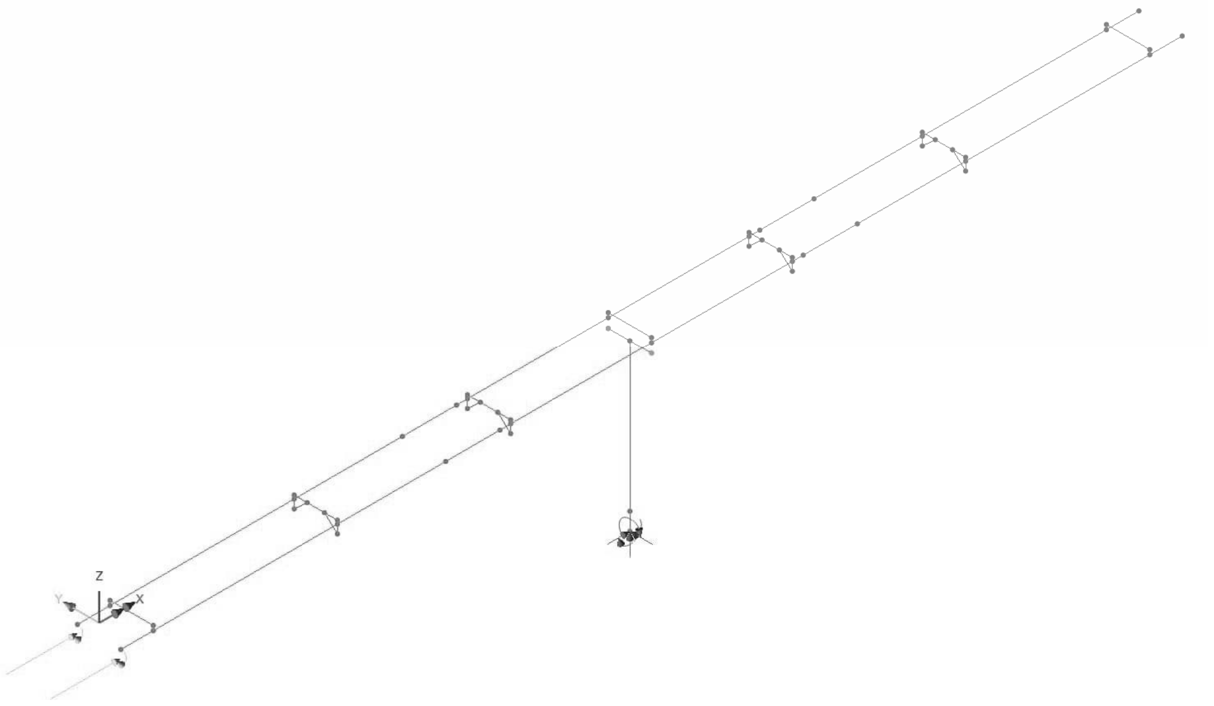
Point moment around Y direction (M_y) : +238 kNm

Distance along local element : 0 m

Load position : About beam axis

Loadcase : OJTEMP+

Analys : Drift-V



Load : OJTEMP-2

Structural loading : Internal beam point

Point load in X direction (P_x) : -1652 kN

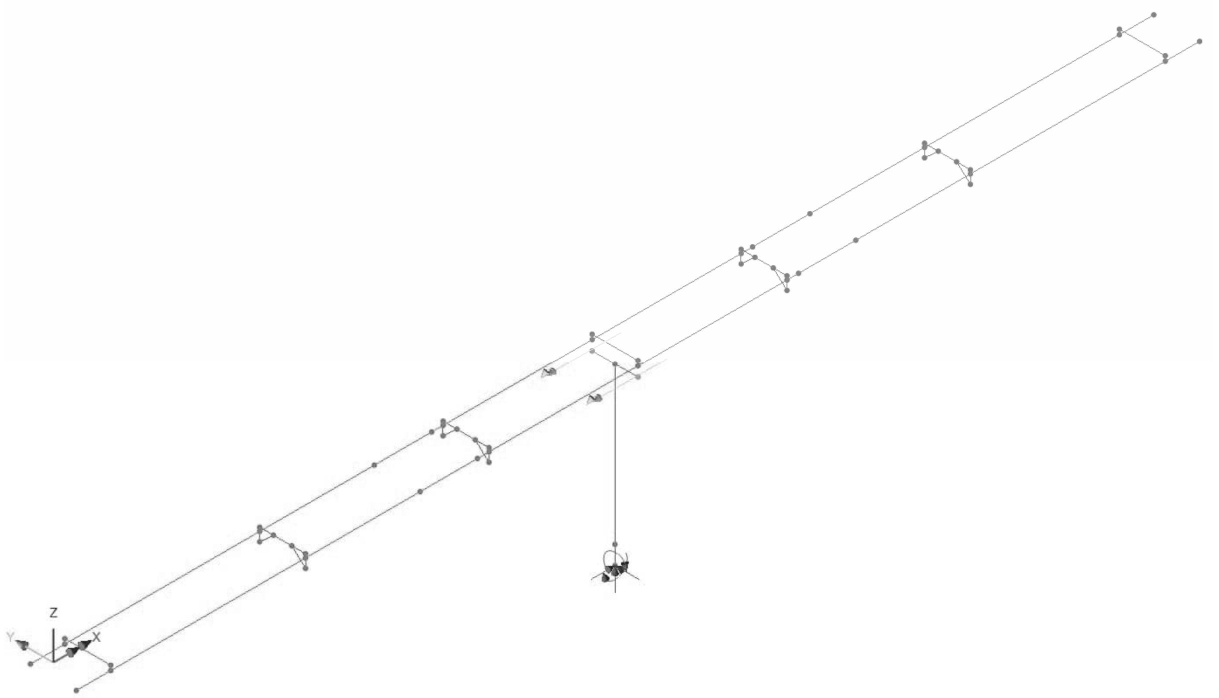
Point moment around Y direction (M_y) : -265 kNm

Distance along local element : +4.52 m

Load position : About beam axis

Loadcase : OJTEMP+

Analys : Drift-V



Load : OJTEMP-3

Structural loading : Internal beam point

Point load in X direction (P_x) : +1652 kN

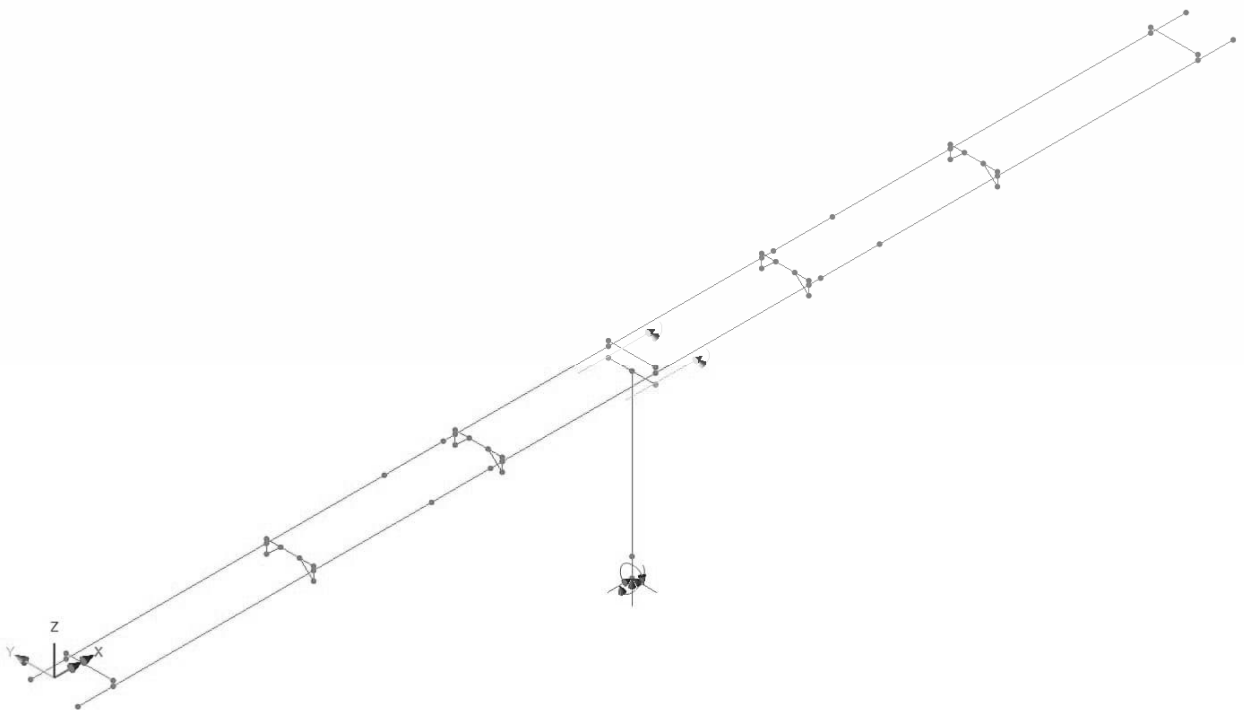
Point moment around Y direction (M_y) : +265 kNm

Distance along local element : +2.0 m

Load position : About beam axis

Loadcase : OJTEMP+

Analys : Drift-V



Load : OJTEMP-4

Structural loading : Internal beam point

Point load in X direction (P_x) : -1652 kN

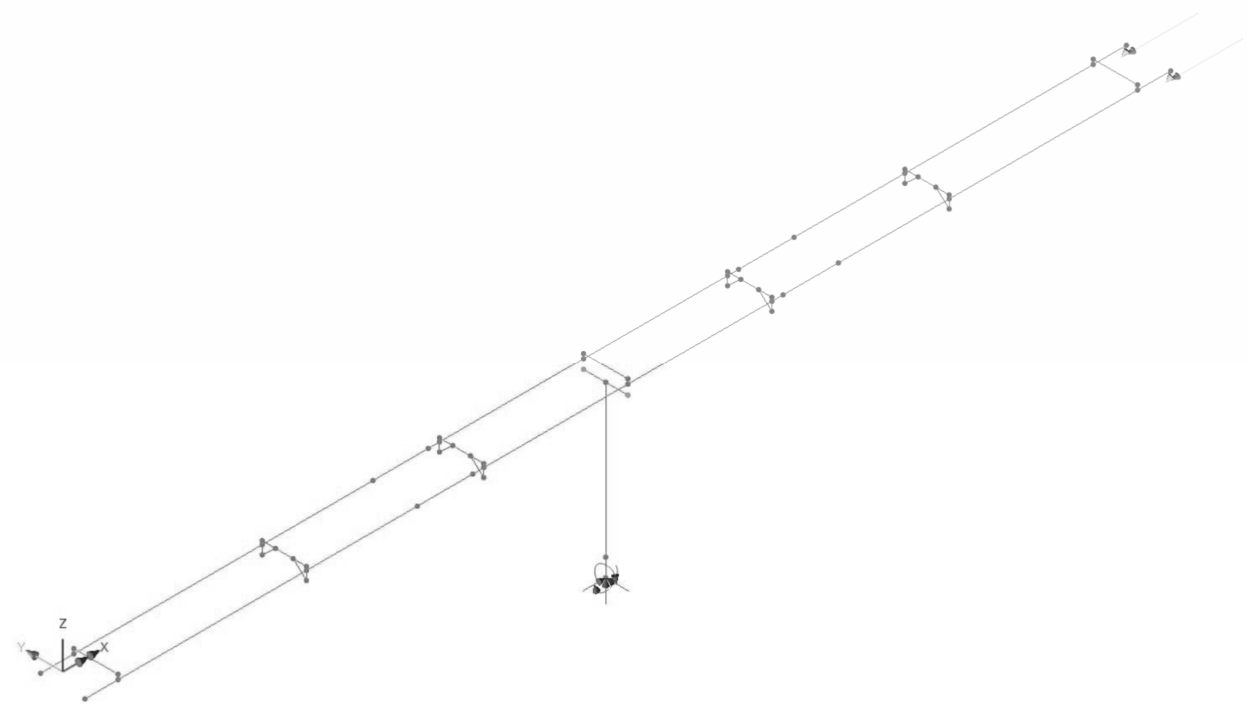
Point moment around Y direction (M_y) : -238 kNm

Distance along local element : +1.5 m

Load position : About beam axis

Loadcase : OJTEMP+

Analys : Drift-V



Basic loadcombination OJTE*MP- :*

Loadcase	Permanent factor	Variable factor
OJTEMP+	0	-1.00

3.11.3 Ojämn temperatur över hela tvärsnittet

Linjär temperaturskillnad över tvärsnitt bestäms enligt EN 1991-1-5 § 6.1.4.1 för beläggningstjocklek 80 mm och typ 2.

$k_{1.sur} = 1.00$

$k_{2.sur} = 1.00$

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

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

<u>Anm.</u> Ojämn temperatur över tvärsnittet anses endast ge upphov till förskjutning i vertikalplanet. Inga tvångskrafter anses uppträda.

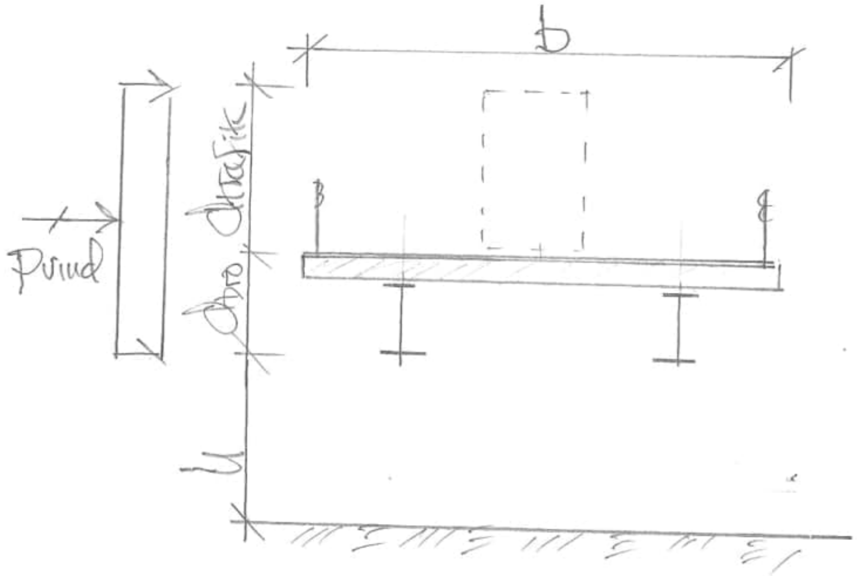
3.12 VINDLAST

Vindlast på broar anges i EN 1991-1-4 §8 dock anges inte belastningshöjd mot trafiklast. Belastningshöjd 1.5 m ovanförbeläggning väljs erfarenhetsmässigt.

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

$h = 5.2m$ men 6.0 m väljs på säker sida ! : avstånd från mark till UK farbana

$d_{bro} = 0.85m + 0.27m + 0.08m = 1.20m$: höjd kantbalk
$d_{trafik} = 1.5m$: höjd vägtrafik

$\Rightarrow d_{tot} = 1.2m + 1.5m = 2.7m$

$v_b(Stockholm; z = 10m; z_0 = 0.05m) = 24\frac{m}{s}$: TRVFS 2011:12 Bilaga 4 tabell 4.1

$q_p(h = 6m; Terrängtyp\_II, v_b = 24\frac{m}{s}) = 0.66\frac{kN}{m^2}$: TRVFS 2011:12 Bilaga 4 tabell 4.2

$$q_b = \frac{1}{2} \cdot \rho \cdot v_b^2 = \frac{1}{2} \cdot 1.25 \frac{kg}{m^3} \cdot \left(24 \frac{m}{s} \right)^2 = 0.36 \frac{kN}{m^2}$$

$$c_e = \frac{q_p}{q_b} = \frac{0.66kPa}{0.36kPa} = 1.8$$

$$b = 4.7m$$

$$\Rightarrow \frac{b}{d} = 1.7$$

$$d_{tot} = 2.7m$$

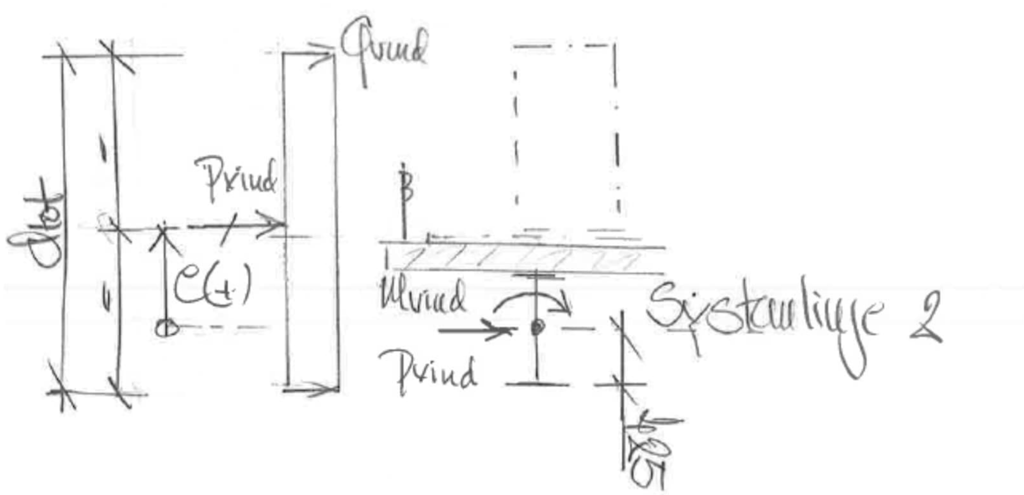
$$c_{f.x}(\frac{b}{d_{tot}} = 1.7) = 2.0$$: SS-EN 1991-1-4 figur 8.3

$$C = c_e \cdot c_{f.x} = 1.8 \cdot 2.0 = 3.6$$

$$q_{vind.x} = \frac{1}{2} \cdot \rho \cdot v_b^2 \cdot C = \frac{1}{2} \cdot 1.25 \frac{kg}{m^3} \cdot \left(24 \frac{m}{s} \right)^2 \cdot 3.6 = 1.3kPa$$

$$p_{vind} = \pm q_{vind.y} \cdot d_{tot} = \pm 1.3kPa \cdot 2.7m = \pm 3.5 \frac{kN}{m}$$

$$m_{vind} = p_{vind} \cdot e = \pm 3.5 \frac{kN}{m} \cdot \left(\frac{2.7m}{2} - 0.425m \right) = \pm 3.2 \frac{kNm}{m}$$



Load : VIND+

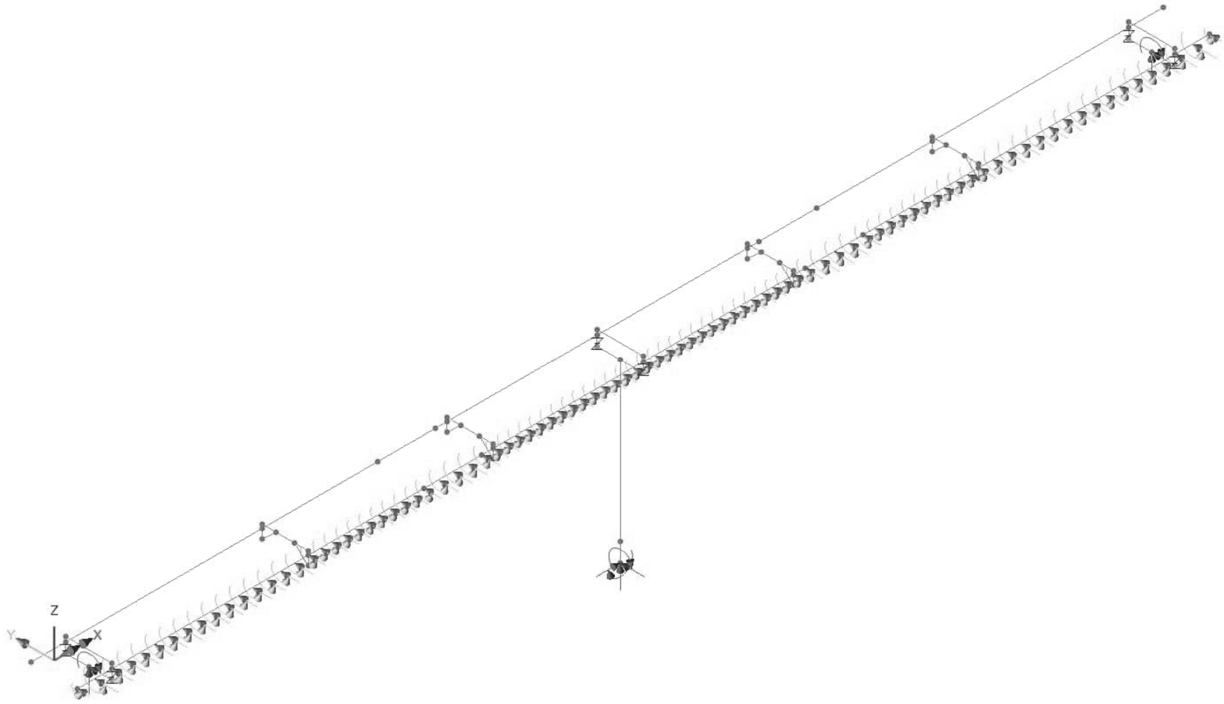
Structural loading : Global distributed

Line load in Y direction (p_y) : +3.5 $\frac{kN}{m}$

Line moment about X axis (m_y) : -3.2 $\frac{kNm}{m}$

Loadcase : VIND+

Analys : Drift-V



Load : VIND-

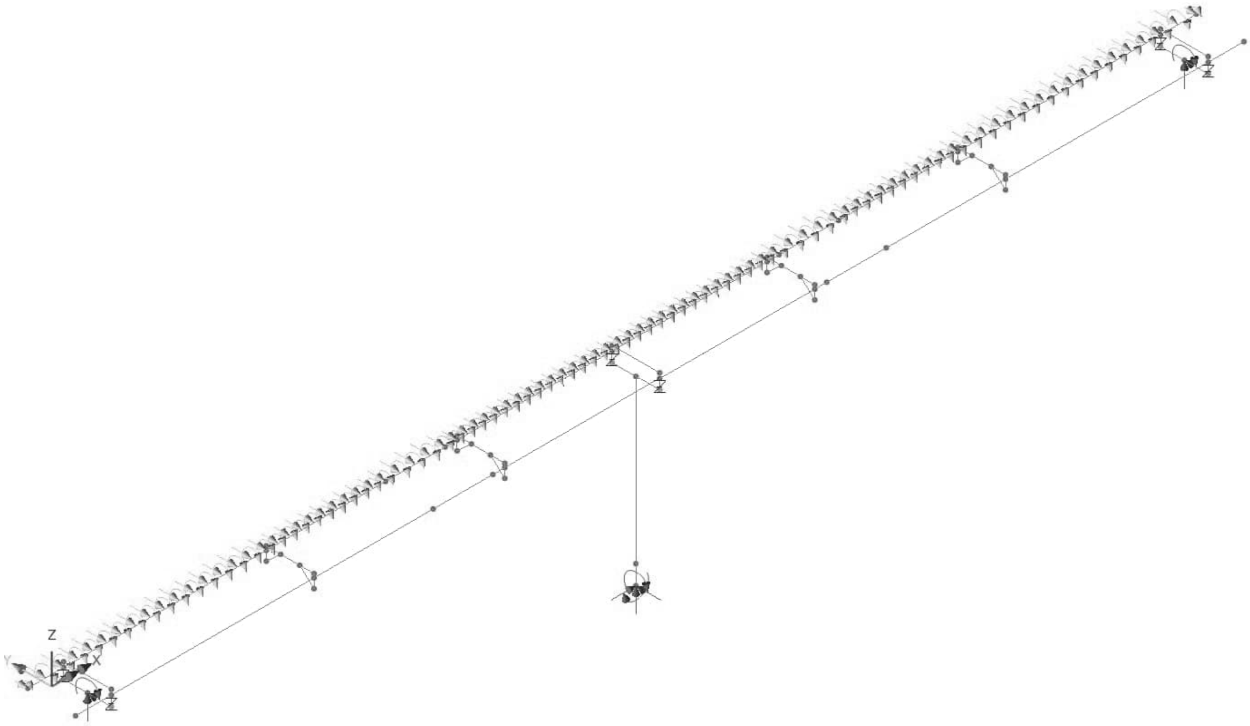
Structural loading : Global distributed

Line load in Y direction (p_y) : -3.5 $\frac{kN}{m}$

Line moment about X axis (m_y) : +3.2 $\frac{kNm}{m}$

Loadcase : VIND-

Analys : Drift-V



Envelopes VIND :

Loadcase
VIND+
VIND-

3.13 ÖKAT JORDTRYCK AV RÖRELSE

Erforderlig rörelse för att utbilda passivt jordtryck enligt EN 1997-1 Annex C table C.2 fall b tillhörande *dense soil*.

Fullt passivt jordtryck ($\sigma = \sigma_p$) uppträder vid förskjutning 0.03h och 0.06h (vid kontroll tillämpas 0.05h) : $v = v_p = 0.05h = 0.05 \cdot 2610mm = 131mm$

Halvt passivt jordtryck uppträder vid förskjutning 0.005h och 0.010h (vid kontroll tillämpas 0.005h) : $v = 0.005h = 13mm$

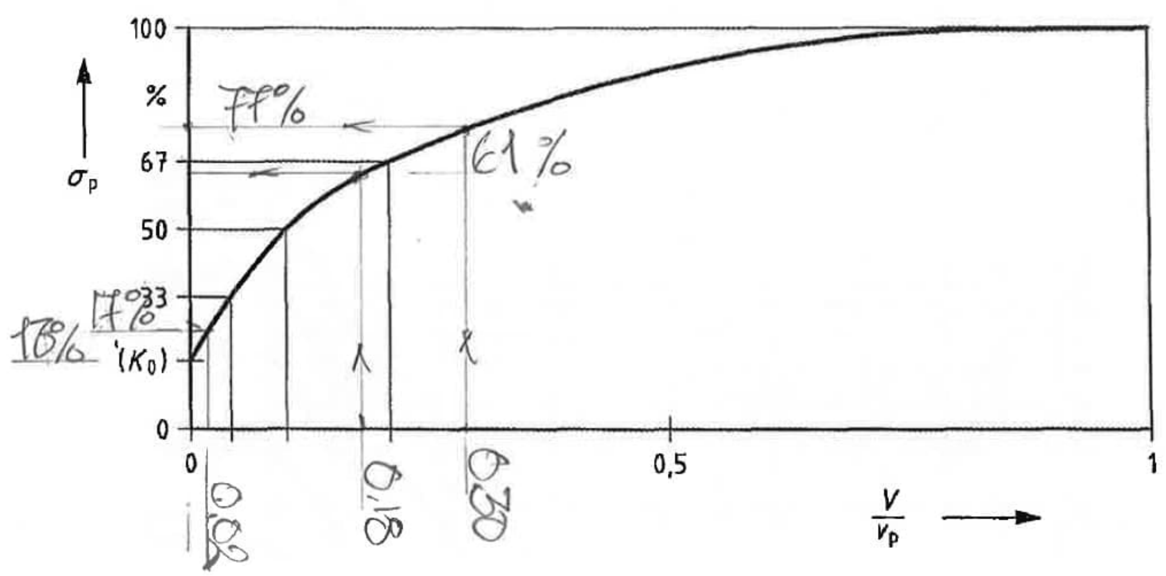


Figure C.3 — Mobilisation of passive earth pressure of non-cohesive soil versus normalised wall displacement v/v_p
(v_p: displacement for the full mobilisation of passive earth pressure)

3.13.1 Inverkan av temperatur (JTEMP)

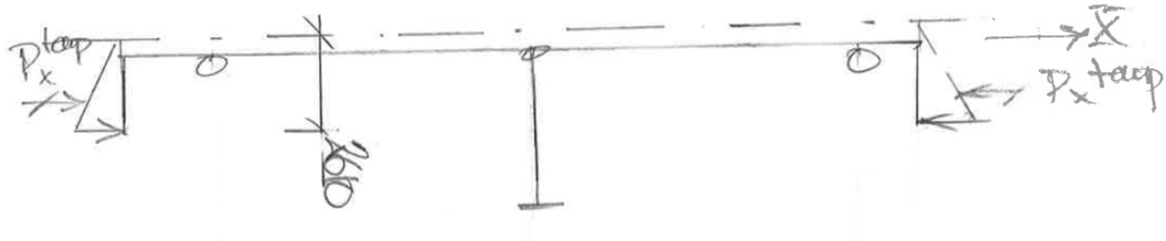
$$v_t = \Delta T \cdot \alpha \cdot \frac{L}{2} = (30^o C + 39^o C) \cdot 1.2 \cdot 10^{-5} \cdot \frac{49000}{2} = 24mm$$

$$\frac{v_t}{v_p} = \frac{24mm}{131mm} = 0.18 \rightarrow \sigma = 0.61\sigma_p$$

$$P_x^{temp} = 0.61 P_x^{passiv} - P_x^{vilo} = 0.61 \cdot 635kN - 59kN = 328kN$$

$$q_x^{temp}(s_1) = q_x^{vilo} \cdot \frac{P_x^{temp}}{P_x^{vilo}} = q_x^{vilo}(s_1) \cdot \frac{328kN}{59kN} = 5.56 q_y^{vilo}(s_1)$$

$$p_x^{temp}(2.61m) = 5.56 \cdot 44.9 \frac{kN}{m} = 250 \frac{kN}{m}$$



$$M_y^{temp} = P_x^{temp} \cdot e = 328kN \cdot 1.0m = 328kNm$$

Load : JTEMP 1

Structural loading : Internal beam point

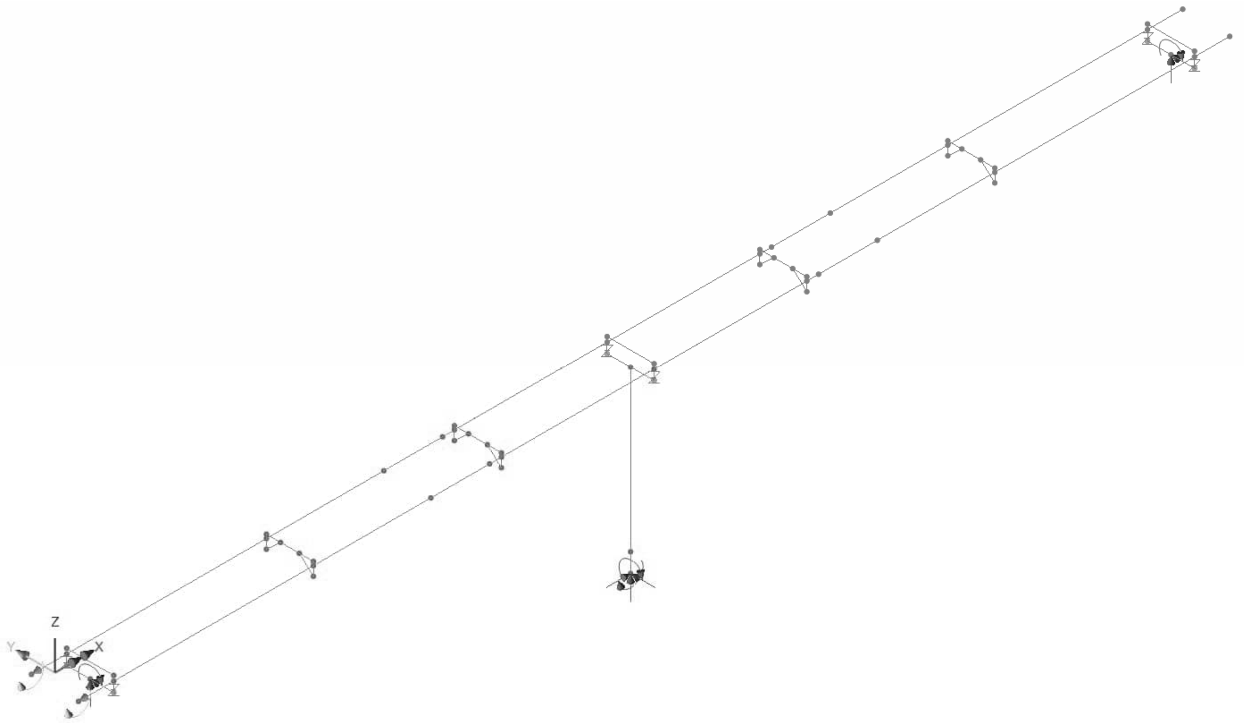
Point load in X direction (P_x) : +328 kN

Point moment around Y direction (M_y) : -328 kNm

Distance along local element : 0 m

Loadcase : JTEMP 1

Analys : Drift-V



Load : JTEMP 2

Structural loading : Internal beam point

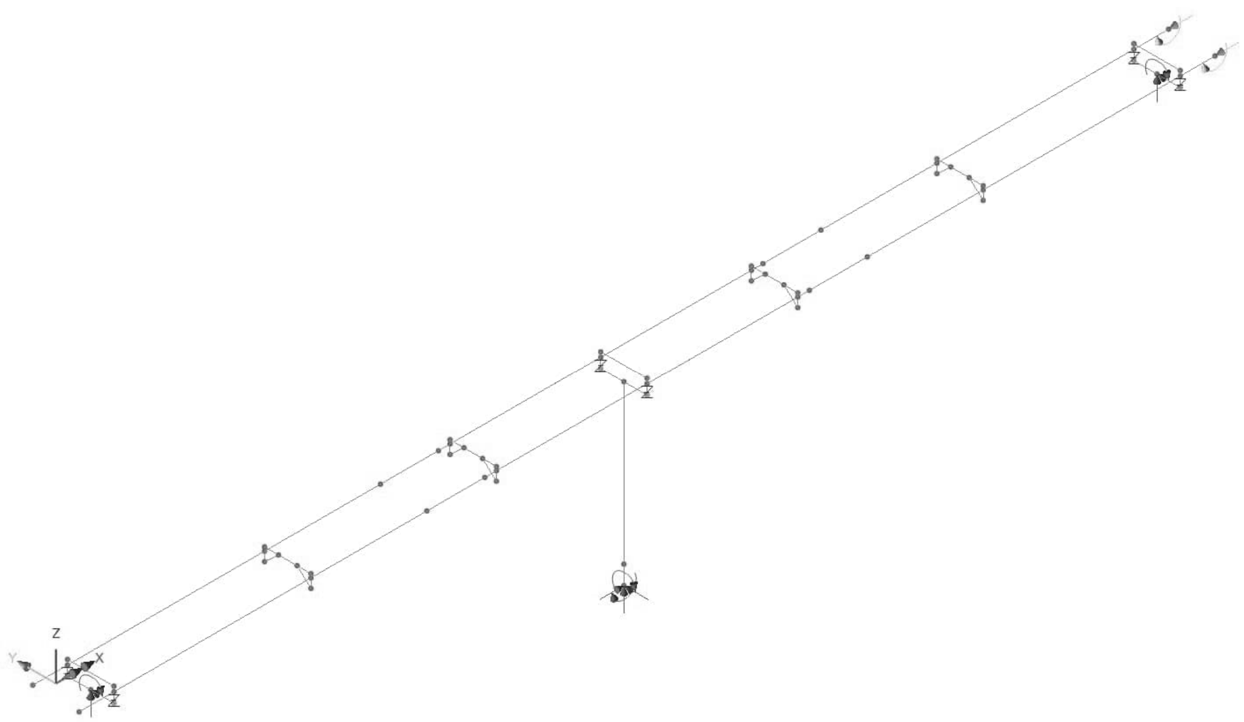
Point load in X direction (P_x) : -328 kN

Point moment around Y direction (M_y) : +328 kNm

Distance along local element : +1.5 m

Loadcase : JTEMP 2

Analys : Drift-V



Basic loadcombination JTEMP :

Loadcase	Factor
JTEMP 1	1.00
JTEMP 2	1.00

3.13.2 Inverkan av bromslast

Deformationer se bilaga 7.

$Q_{broms} = \frac{98kN}{2} = 49kN$ och $\Delta P^{(0)}_{broms} = 0kN \rightarrow \Delta^{(0)}_{broms} = 5.8mm$

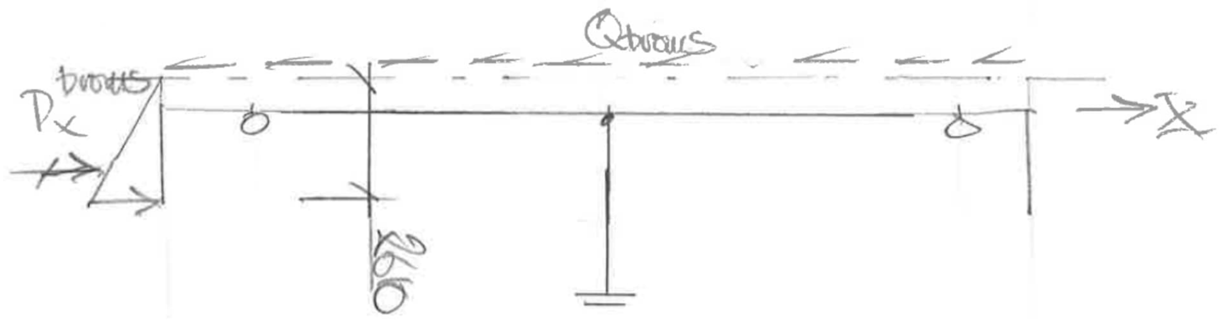
${\Delta_{broms}}^{(1)} = 1.5mm$: antas

$$\frac{\Delta^{(1)}_{broms}}{v_p} = \frac{1.5mm}{131mm} = 0.01 \rightarrow \sigma^{(1)}_{broms} = 0.15\sigma_p$$

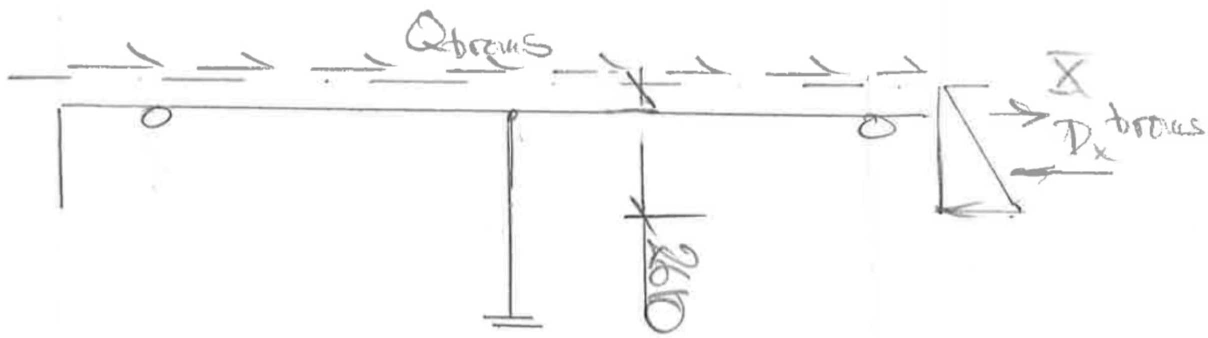
$$P_x^{broms(1)} \equiv 0.15P^{(1)}_{passiv} - P_x^{vilo} = 0.15 \cdot 635kN - 59kN = 36kN$$

$\Delta P^{(1)}_{broms} = 36kN \rightarrow \Delta^{(1)}_{broms} = 1.5mm$ VSB !

$$\kappa = \frac{\Delta P_{broms}}{P_x^{vilo}} = \frac{36kN}{59kN} = 0.61$$



BROMS-V



BROMS-H

Basic loadcombination BROMS-V :

Loadcase	Factor
Px = -49 kN	1.00
JORD 1	0.61

Basic loadcombination BROMS-H :

Loadcase	Factor
Px = -49 kN	1.00
JORD 2	0.61

Envelopes BROMS :

Loadcase
BROMS-V
BROMS-H

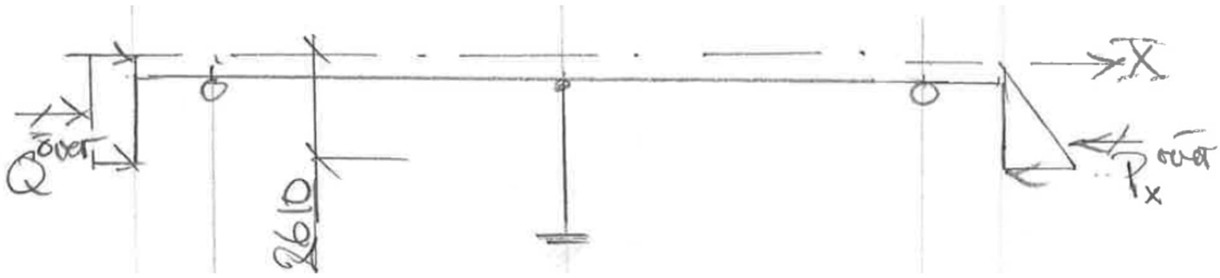
3.13.3 Inverkan av ensidig överlast

Deformationer se bilaga 7.

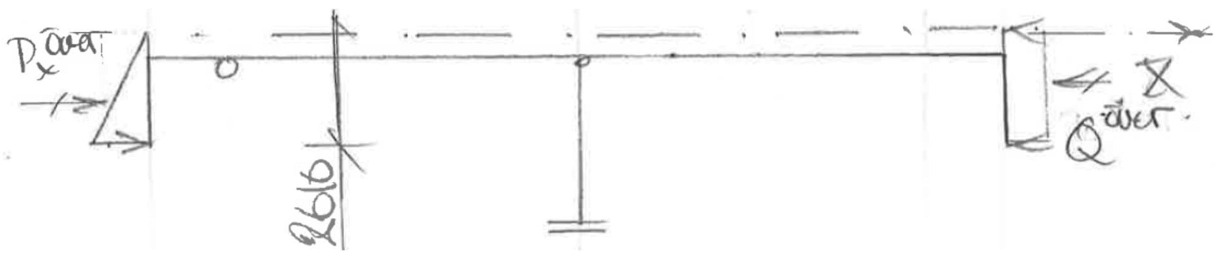
$Q_{över} = 11kN$ och $P_x^{över(0)} = 0kN \rightarrow \Delta_{över}^{(0)} = 1.3mm$

Då $Q_{över} < P_x^{vilo} = 59kN$ så antas all last upptas i mellanstöd på säker sida !

$\Rightarrow$ Inget mothållande jordtryck anses uppträda dvs $P_x^{över} = 0kN$



OVER-V



OVER-H

Basic loadcombination OVER-V :

Loadcase	Factor
OVER 1	1.00
JORD 2	0

Basic loadcombination OVER-H :

Loadcase	Factor
OVER 2	1.00
JORD 1	0

Basic loadcombination OVER-VH :

Loadcase	Factor
OVER 1	1.00
OVER 2	1.00

Envelopes OVER :

Loadcase
OVER-V
OVER-H
OVER-VH

3.13.4 Största förskjutning ULS

Kontroll av största förskjutning i brottgränstillstånd.

$$v_{ULS} = 1.50 v_{temp} + 1.13 \cdot (v_{broms} + v_{över}) = 1.5 \cdot 24mm + 1.13 \cdot (3mm + 0mm) = 39mm$$

$$\frac{v_{ULS}}{v_p} = \frac{39mm}{131mm} = 0.30 \rightarrow \frac{\sigma_{ULS}}{\sigma_p} = 0.77 < 1.00 \text{ dvs OK !}$$

3.14 OLYCKSLASTFALL

Två möjliga olyckslastfall anses uppträda motsvarande påkörning av överbyggnad eller underbyggnad.

Väg 276 anses är en primär länsväg som varken är motor- eller riksväg. På säker sida tillämpas näst högsta påkörningslast.

3.14.1 Påkörning av underbyggnad

Säkerhetszonen bestäms enligt VGU med förutsättning av VR80 utan räcke med släntlutning ≤ 1:4 (se Figur 1.1-14).

Sidomått för säkerhetszon från körbanekant : $s_{zon} = 3m + 8m = 11m$

Endast mellanstöd anses beläget inom säkerhetszonen skall dimensioneras för påkörning.

Trafiklasten angripa 1.5 m ovanför marknivå/vägbanan vilket motsvarar last tillhörande lastbil.

Lastytan (Δ_z x $\Delta_{x,y}$) : 0.50 m x 1.50 m

Stöd 2 (övriga stöd anses obelastade) :

$F_Y = 750kN$: last vinkelrätt bro enligt SS-EN 1991-1-7 punkt 4.3.1(1) tabell 4.1

$F_X = 375kN$: last parallellt bro enligt SS-EN 1991-1-7 punkt 4.3.1(1) tabell 4.1

6.14.2 Påkörning av överbyggnad

Överbyggnaden skall dimensioneras för påkörningslast enligt SS-EN 1991-7 avsnitt 4.3.2.

Lägsta fri höjd uppgår till 5.30 m. Vid dimensionering sker ingen reduktion av påkörningslast på säker sida.

Överbyggnad dimensioneras för $F_Y = 375kN$ vinkelrätt broenligt SS-EN 1991-1-7 punkt 4.3.2(1) tabell 4.2.

3.15 LASTKOMBINATIONER

Kontroll av bärförmågan skall utföras med de två förekommande skedena enligt redovisning nedan. Utvärdering av risken för utmattning utgår för studerad konstruktion.

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.

EQU : Verifiering av risk för stjälpning av konstruktionen

STR/GEO : Verifiering av statisk och geoteknisk bärförmåga

Vid dimensionering tillämpas en ”förenklad metod” för lastkoefficienter. Bestämning av de förenklade lastkoefficienterna utförs med beräkningsark PROG T045 där samtliga formler och delresultat redovisas.

3.15.1 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.

<u>Förenklad metod (se sida A3:126)</u>

Nr	Last		$\psi\gamma_{ULS\text{-}A}$	$\psi\gamma_{ULS\text{-}B}$
	<u>Permanenta laster</u>			
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	max	1.35	1.20
		min	1.00	1.00
7	Krympning	max	1.35	1.20
		min	1.00	1.00
8	Spännkraft	max	1.35	1.35
		min	1.00	1.00
	<u>Variabla laster</u>			
	Lastmodell 1 :			
9	Utbredd last		0.60	0.60/1.50
	Lastmodell 2 :			
10	Enstaka axellast		0	0/1.50
	Lastmodell 3 :			
11	Servicefordon		0	0/1.50
12	Bromskraft		0	0/1.50
13	Sidokraft		0	0/1.50
14	Snölast		1.05	1.05/1.50
15	Temperatur		0.90	0.90/1.50
	Vindlaster:			
16	Vindlast mot bro		0.45	0.45/1.50
17	Vindlast mot trafik		0.45	0.45/1.50
18	Överlast		1.13	1.13/1.50

3.15.1.1 Byggskede

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

Loadcombination smart *ULS-BP :*

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

3.15.1.2 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
EGEN	1.00	0.20
FORM-	1.00	0
BELAGG	1.00	0.20
JORD	1.00	0.20
STOD	0	1.20

Loadcombination smart *ULS-DK :*

Loadcase	Permanent factor	Variable factor
KRYMP	0	1.00

Loadcombination smart *TEMP :*

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

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

Loadcase	Permanent factor	Variable factor
TRAFIK	0.60	0.90
BROMS	0	1.50
OVER	1.13	0.37
TEMP	0.90	0.60
VIND	0.45	1.05

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	1.00	0.20
FORM+	1.20	0

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

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

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

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

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

Loadcase	Permanent factor	Variable factor
TRAFIK	0.60	0.90
BROMS	0	1.50
OVER	1.13	0.37
VIND	0.45	1.05

3.15.2 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 A3:135)

Nr	Last		$\psi\gamma_{SLS-K}$	$\psi\gamma_{SLS-F}$	$\psi\gamma_{SLS-Q}$
	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	0	0	0
7	Krympning	max	1.00	1.00	1.00
		min	0	0	0
8	Spännkraft	max	1.00	1.00	1.00
		min	1.00	1.00	1.00
	Variabla laster				
	Lastmodell 1 :				
9	Utbredd last		0.40/1.00	0/0.40	0
	Lastmodell 2 :				
10	Enstaka axellast		0/1.00	0	0
	Lastmodell 3 :				
11	Servicefordon		0/1.00	0	0
12	Bromskraft		0/1.00	0	0
13	Sidokraft		0/1.00	0	0
14	Snölast		0.70/1.00	0.20/0.40	0.20
15	Temperatur		0.60/1.00	0.50/0.60	0.50
	Vindlaster:				
16	Vindlast mot bro		0.30/1.00	0/0.20	0
17	Vindlast mot trafik		0.30/1.00	0/0.20	0
18	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
JORD	1.00	0
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	0.40	0.60
BROMS	0	1.00
OVER	0.75	0.25
TEMP	0.60	0.40
VIND	0.30	0.70

Loadcombination smart *SLS-VAR-F :*

Loadcase	Permanent factor	Variable factor
TRAFIK	0	0.40
OVER	0	0.75
TEMP	0	0.60
VIND	0	0.20

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
EGEN	1.00	0
FORM+	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
JORD	1.00	0

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
JTEMP	0	1.00
OJTEMP+	0	1.00
OJTEMP-	0	1.00

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

Loadcase	Permanent factor	Variable factor
TRAFIK	0.40	0.60
BROMS	0	1.00
OVER	0.75	0.25
VIND	0.30	0.70

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

Loadcase	Permanent factor	Variable factor
EGEN	1.00	0
FORM+	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
JORD	1.00	0

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
JTEMP	0	0.60
OJTEMP+	0	0.60
OJTEMP-	0	0.60

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

Loadcase	Permanent factor	Variable factor
TRAFIK	0	0.40
OVER	0	0.75
VIND	0	0.20

3.15.3 Olyckslastfall

Olyckslastfallet betecknas även exceptionell lastkombination EXC enligt SS-EN 1990 avsnitt 6.4.3.3 ekvation 6.11a enligt redovisning nedan.

Olyckslastfallet betecknas A_d och utgörs för studerad bro av påkörning av vägfordon respektive tåg.

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

Se sammanställning enligt se sida A3:144

Nr	Last		$\psi\gamma_{EXC}$
	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	Utbredd last		0/0.40
	Lastmodell LM 2 :		
10	Enstaka axellast		0
	Lastmodell LM 3 :		
11	Renhållningsfordon		0
12	Bromskraft		0
13	Sidokraft		0
14	Snölast		0.20/0.40
15	Temperatur		0.50/0.60
	Vindlaster:		
16	Vindlast mot bro		0/0.20
17	Vindlast mot trafik		0/0.20
18	Överlast		0/0.75
19	Olyckslast (A_d)		1.00

Loadcombination smart EXC-PERM :

Loadcase	Permanent factor	Variable factor
EGEN	1	0
BELÄGG	1	0
STOD	0	1

Loadcombination smart *EXC-VAR:*
(Loadcases to consider : 2 / Variable loadcases : 1)

Loadcase	Permanent factor	Variable factor
LM 1	0	0.40
TEMP	0	0.60

Loadcombination smart EXC :

Loadcase	Permanent factor	Variable factor
EXC-PERM	1	0
EXC-VAR	1	0
PÅKÖRNING	0	1

Anm. I samband med interngranskning påträffades att inte snö behöver beaktas enligt SS-EN 1990 A1 avsnitt A2.2.2.5(1).

3.15.4 Beräkningsark PROG T060

Härledning av de förenklade lastkoefficienttabellerna utförs med beräkningsark PROG B060.

Objekt : GC-bro

Säkerhetsklass

$\gamma_d = 1.00$

Permanenta laster

$$G_{k,j}^{\sup} = \eta_{\sup,j} \cdot G_{k,j}$$

$$G_{k,j}^{\inf} = \eta_{\inf,j} \cdot G_{k,j}$$

Lastkoefficienter avseende sannolikhet för avvikelser från karakteristiska värden i brottgränstillstånd

Nr.	Last	ξ	$\gamma_{G,sup}$	$\gamma_{G,inf}$	Anm.
1	Egentyngd	0.89	1.35	1.00	SS-EN 1990 bilaga A2 Tabell A2.4(B) + TRVFS 2011:12
2	Beläggning	0.89	1.35	1.00	-"- -"- -"- -"-
3	Överfyllnad	0.89	1.35	1.00	-"- -"- -"- -"-
4	Jordtryck	0.89	1.35	1.00	-"- -"- -"- -"-
5	Vattentryck	0.89	1.35	1.00	-"- -"- -"- -"-
6	Stödförskjutning	0.89	1.35	1.00	-"- -"- -"- -"-
7	Krympning	0.89	1.35	1.00	-"- -"- -"- -"-

Nr.	Last	γ_P	Anm.
8	Spännkraft	1.35	SS-EN 1990 bilaga A2 Tabell A2.4(B) + TRVFS 2011:12

Koefficienter avseende variationer av karakteristiska värden

Nr.	Last	η_{sup}	η_{inf}	Anm.
1	Egentyngd	1.00	1.00	Spridning enligt gängse beräkningspraxis
2	Beläggning	1.10	0.90	-"- -"- -"- -"-
3	Överfyllnad	1.10	0.90	-"- -"- -"- -"-
4	Jordtryck	1.10	0.90	-"- -"- -"- -"-
5	Vattentryck	1.00	1.00	-"- -"- -"- -"-
6	Stödförskjutning	1.00	1.00	-"- -"- -"- -"-
7	Krympning	1.00	1.00	-"- -"- -"- -"-

Variabla laster

Lastkoefficienter avseende varaktighet och frekvens hos karakteristiska värden

Nr.	Last	ψ_k	ψ_0	ψ_1	ψ_2	Anm.
	Lastsystem 1 (LM 1)					
9	Utbredd last	1.00	0.40	0.40	0	SS-EN 1990 bilaga A2 Tabell A2.2
	Lastsystem 2 (LM 2)					
10	Enstaka axellast	1.00	0	0	0	SS-EN 1990 bilaga A2 Tabell A2.2
	Lastsystem 3 (LM 3)					
11	Servicefordon	1.00	0	0	0	SS-EN 1990 bilaga A2 Tabell A2.2
12	Bromskraft	1.00	0	0	0	-"- -"- -"-
13	Sidokraft	1.00	0	0	0	-"- -"- -"-
	Snölast					
14	Snölast	1.00	0.70	0.40	0.20	TRVFS kapitel 7 §5 Tabell A2.1
	Temperatur					
15	Temperatur	1.00	0.60	0.60	0.50	SS-EN 1990 bilaga A2 Tabell A2.1
	Vindlaster					
16	Vindlast mot bro	1.00	0.30	0.20	0	TRVFS kapitel 7 §5 Tabell a
17	Vindlast mot trafik	1.00	0.30	0.20	0	-"- -"- -"-
	Överlast					
18	Överlast	1.00	0.75	0.75	1.00	TRVFS kapitel 7 §5 Tabell a

Brottgränstillstånd (STR/GEO uppsättning B) enligt SS-EN 1990 avsnitt 6.4.3.2

Ekvation 6.10a :

$$E_{Sd.A}^{\max} = \sum_{j\geq 1} \gamma_{G,j}^{\sup} \cdot G_{k,j} + \gamma_p \cdot P + \gamma_{Q,1} \cdot \psi_{0,1} \cdot Q_{k,1} + \sum_{i>1} \gamma_{Q,i} \cdot \psi_{0,i} \cdot Q_{k,i} = \psi \gamma_{ULS.A}^{\max} \cdot \left(\sum_{j\geq 1} G_{k,j} + P + \sum_{i\geq 1} Q_{k,j}\right)$$

$$E_{Sd.A}^{\min} = \sum_{j\geq 1} \gamma_{G,j}^{\inf} \cdot G_{k,j} + P + \gamma_{Q,1} \cdot \psi_{0,1} \cdot Q_{k,1} + \sum_{i>1} \gamma_{Q,i} \cdot \psi_{0,i} \cdot Q_{k,i} = \psi \gamma_{ULS.A}^{\min} \cdot \left(\sum_{j\geq 1} G_{k,j} + P + \sum_{i\geq 1} Q_{k,j}\right)$$

Ekvation 6.10b :

$$E_{Sd.B}^{\max} = \sum_{j\geq 1} \xi_j \cdot \gamma_{G,j}^{\sup} \cdot G_{k,j} + \gamma_p \cdot P + \gamma_{Q,1} \cdot Q_{k,1} + \sum_{i>1} \gamma_{Q,i} \cdot \psi_{0,i} \cdot Q_{k,i} = \psi \gamma_{ULS.B}^{\max} \cdot \left(\sum_{j\geq 1} G_{k,j} + P + \sum_{i\geq 1} Q_{k,j}\right)$$

$$E_{Sd.B}^{\min} = \sum_{j\geq 1} \gamma_{G,j}^{\inf} \cdot G_{k,j} + P + \gamma_{Q,1} \cdot Q_{k,1} + \sum_{i>1} \gamma_{Q,i} \cdot \psi_{0,i} \cdot Q_{k,i} = \psi \gamma_{ULS.B}^{\min} \cdot \left(\sum_{j\geq 1} G_{k,j} + P + \sum_{i\geq 1} Q_{k,j}\right)$$

Lastkombination nr. 1 med huvudlasten : Lastsystem gr1a (LM1)

Lastkombinatiom enligt ekvation 6.10a : ULS A-1

Lastkombinatiom enligt ekvation 6.10b : ULS B-1

Nr	Last		$\psi\gamma_{ULS.A-1}$	$\psi\gamma_{ULS.B-1}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 1 (LM 1) :				
9	Utbredd last		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.60	$\gamma_d \cdot 1.5$= 1.50	X
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 2 med huvudlasten : Snölast

Lastkombinatiom enligt ekvation 6.10a : ULS A-2

Lastkombinatiom enligt ekvation 6.10b : ULS B-2

Nr	Last		$\psi\gamma_{ULS.A\text{-}2}$	$\psi\gamma_{ULS.B\text{-}2}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 1 (LM 1) :				
9	Utbredd last		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.60	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.60	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot 1.5$= 1.50	X
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 3 med huvudlasten : Temperatur

Lastkombinatiom enligt ekvation 6.10a : ULS A-3

Lastkombinatiom enligt ekvation 6.10b : ULS B-3

Nr	Last		$\psi\gamma_{ULS.A-3}$	$\psi\gamma_{ULS.B-3}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 1 (LM 1) :				
9	Utbredd last		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.60	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.60	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot 1.5$= 1.50	X
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 4 med huvudlasten : Vindlast

Lastkombinatiom enligt ekvation 6.10a : ULS A-4

Lastkombinatiom enligt ekvation 6.10b : ULS B-4

Nr	Last		$\psi\gamma_{ULS.A-4}$	$\psi\gamma_{ULS.B-4}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 1 (LM 1) :				
9	Utbredd last		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.60	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.60	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot 1.5$= 1.50	X
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot 1.5$= 1.50	X
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 5 med huvudlasten : Överlast

Lastkombinatiom enligt ekvation 6.10a : ULS A-5

Lastkombinatiom enligt ekvation 6.10b : ULS B-5

Nr	Last		$\psi\gamma_{ULS.A\text{-}5}$	$\psi\gamma_{ULS.B\text{-}5}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}=$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}=$ 1.20	
		min	$\gamma_{inf,G}=$ 1.00	$\gamma_{inf,G}=$ 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}=$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}=$ 1.20	
		min	$\gamma_{inf,G}=$ 1.00	$\gamma_{inf,G}=$ 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}=$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}=$ 1.20	
		min	$\gamma_{inf,G}=$ 1.00	$\gamma_{inf,G}=$ 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}=$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}=$ 1.20	
		min	$\gamma_{inf,G}=$ 1.00	$\gamma_{inf,G}=$ 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}=$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}=$ 1.20	
		min	$\gamma_{inf,G}=$ 1.00	$\gamma_{inf,G}=$ 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}=$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}=$ 1.20	
		min	$\gamma_{inf,G}=$ 1.00	$\gamma_{inf,G}=$ 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}=$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}=$ 1.20	
		min	$\gamma_{inf,G}=$ 1.00	$\gamma_{inf,G}=$ 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35=$ 1.35	$\gamma_d \cdot 1.35=$ 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 1 (LM 1) :				
9	Utbredd last		$\gamma_d \cdot \psi_0 \cdot 1.5=$ 0.60	$\gamma_d \cdot \psi_0 \cdot 1.5=$ 0.60	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5=$ 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5=$ 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5=$ 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5=$ 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5=$ 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5=$ 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5=$ 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5=$ 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5=$ 1.13	$\gamma_d \cdot 1.5=$ 1.50	X

Lastkombination nr. 6 med huvudlasten : Lastsystem 2 (LM 2)

Lastkombinatiom enligt ekvation 6.10a : ULS A-6

Lastkombinatiom enligt ekvation 6.10b : ULS B-6

Nr	Last		$\psi\gamma_{ULS.A-6}$	$\psi\gamma_{ULS.B-6}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 2 (LM 2) :				
10	Enstaka axellast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot 1.5$= 1.50	X
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 7 med huvudlasten : Snölast

Lastkombinatiom enligt ekvation 6.10a : ULS A-7

Lastkombinatiom enligt ekvation 6.10b : ULS B-7

Nr	Last		$\psi\gamma_{ULS.A-7}$	$\psi\gamma_{ULS.B-7}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 2 (LM 2) :				
10	Enstaka axellast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot 1.5$= 1.50	X
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 8 med huvudlasten : Temperatur

Lastkombinatiom enligt ekvation 6.10a : ULS A-8

Lastkombinatiom enligt ekvation 6.10b : ULS B-8

Nr	Last		$\psi\gamma_{ULS.A\text{-}8}$	$\psi\gamma_{ULS.B\text{-}8}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 2 (LM 2) :				
10	Enstaka axellast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot 1.5$= 1.50	X
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 9 med huvudlasten : Vindlast

Lastkombinatiom enligt ekvation 6.10a : ULS A-9

Lastkombinatiom enligt ekvation 6.10b : ULS B-9

Nr	Last		$\psi\gamma_{ULS.A\text{-}9}$	$\psi\gamma_{ULS.B\text{-}9}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G} =$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G} =$ 1.20	
		min	$\gamma_{inf,G} =$ 1.00	$\gamma_{inf,G} =$ 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G} =$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G} =$ 1.20	
		min	$\gamma_{inf,G} =$ 1.00	$\gamma_{inf,G} =$ 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G} =$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G} =$ 1.20	
		min	$\gamma_{inf,G} =$ 1.00	$\gamma_{inf,G} =$ 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G} =$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G} =$ 1.20	
		min	$\gamma_{inf,G} =$ 1.00	$\gamma_{inf,G} =$ 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G} =$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G} =$ 1.20	
		min	$\gamma_{inf,G} =$ 1.00	$\gamma_{inf,G} =$ 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G} =$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G} =$ 1.20	
		min	$\gamma_{inf,G} =$ 1.00	$\gamma_{inf,G} =$ 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G} =$ 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G} =$ 1.20	
		min	$\gamma_{inf,G} =$ 1.00	$\gamma_{inf,G} =$ 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35 =$ 1.35	$\gamma_d \cdot 1.35 =$ 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 2 (LM 2) :				
10	Enstaka axellast		$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 0	$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 0	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 0.45	$\gamma_d \cdot 1.5 =$ 1.50	X
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 0.45	$\gamma_d \cdot 1.5 =$ 1.50	X
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5 =$ 1.13	

Lastkombination nr. 10 med huvudlasten : Överlast

Lastkombinatiom enligt ekvation 6.10a : ULS A-10

Lastkombinatiom enligt ekvation 6.10b : ULS B-10

Nr	Last		$\psi\gamma_{ULS.A-10}$	$\psi\gamma_{ULS.B-10}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 2 (LM 2) :				
10	Enstaka axellast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot 1.5$= 1.50	X

Lastkombination nr. 11 med huvudlasten : Lastsystem 3 (LM 3)

Lastkombinatiom enligt ekvation 6.10a : ULS A-11

Lastkombinatiom enligt ekvation 6.10b : ULS B-11

Nr	Last		$\psi\gamma_{ULS.A-11}$	$\psi\gamma_{ULS.B-11}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 3 (LM 3) :				
11	Servicefordon		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot 1.5$= 1.50	X
12	Bromskraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot 1.5$= 1.50	X
13	Sidokraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot 1.5$= 1.50	X
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 12 med huvudlasten : Snölast

Lastkombinatiom enligt ekvation 6.10a : ULS A-12

Lastkombinatiom enligt ekvation 6.10b : ULS B-12

Nr	Last		$\psi\gamma_{ULS.A-12}$	$\psi\gamma_{ULS.B-12}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 3 (LM 3) :				
11	Servicefordon		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
12	Bromskraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
13	Sidokraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot 1.5$= 1.50	X
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 13 med huvudlasten : Temperatur

Lastkombinatiom enligt ekvation 6.10a : ULS A-13

Lastkombinatiom enligt ekvation 6.10b : ULS B-13

Nr	Last		$\psi\gamma_{ULS.A-13}$	$\psi\gamma_{ULS.B-13}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 3 (LM 3) :				
11	Servicefordon		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
12	Bromskraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
13	Sidokraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot 1.5$= 1.50	X
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 14 med huvudlasten : Vindlast

Lastkombinatiom enligt ekvation 6.10a : ULS A-14

Lastkombinatiom enligt ekvation 6.10b : ULS B-14

Nr	Last		$\psi\gamma_{ULS.A-14}$	$\psi\gamma_{ULS.B-14}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 3 (LM 3) :				
11	Servicefordon		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
12	Bromskraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
13	Sidokraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot 1.5$= 1.50	X
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot 1.5$= 1.50	X
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	

Lastkombination nr. 15 med huvudlasten : Överlast

Lastkombinatiom enligt ekvation 6.10a : ULS A-15

Lastkombinatiom enligt ekvation 6.10b : ULS B-15

Nr	Last		$\psi\gamma_{ULS.A\text{-}15}$	$\psi\gamma_{ULS.B\text{-}15}$	Största last
	Permanenta laster				
1	Egentyngd	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
2	Beläggning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
3	Överfyllnad	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
4	Jordtryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
5	Vattentryck	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
6	Stödförskjutning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
7	Krympning	max	$\gamma_d \cdot \gamma_{sup,G}$= 1.35	$\gamma_d \cdot 0.89 \cdot \gamma_{sup,G}$= 1.20	
		min	$\gamma_{inf,G}$= 1.00	$\gamma_{inf,G}$= 1.00	
8	Spännkraft	max	$\gamma_d \cdot 1.35$= 1.35	$\gamma_d \cdot 1.35$= 1.35	
		min	1.00	1.00	
	Variabla laster				
	Lastsystem 3 (LM 3) :				
11	Servicefordon		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
12	Bromskraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
13	Sidokraft		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0	
	Snölast :				
14	Snölast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.05	
	Temperatur :				
15	Temperatur		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.90	
	Vindlaster :				
16	Vindlast mot bro		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
17	Vindlast mot trafik		$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	$\gamma_d \cdot \psi_0 \cdot 1.5$= 0.45	
	Överlast :				
18	Överlast		$\gamma_d \cdot \psi_0 \cdot 1.5$= 1.13	$\gamma_d \cdot 1.5$= 1.50	X

Förenklad metod :

Lastkombination ULS-A innebär enveloppet för lastkombinationer ULS.A-1, ULS.A-2, ... ULS.A-15.
Lastkombination ULS-B innebär enveloppet för lastkombinationer ULS.B-1, ULS.B-2, ... ULS.B-15.

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	max	1.35	1.20
		min	1.00	1.00
7	Krympning	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	Utbredd last		0.60	0.60/1.50
	Lastmodell LM 2 :			
10	Enstaka axellast		0	0/1.50
	Lastmodell LM 3 :			
11	Servicefordon		0	0/1.50
12	Bromskraft		0	0/1.50
13	Sidokraft		0	0/1.50
14	Snölast		1.05	1.05/1.50
15	Temperatur		0.90	0.90/1.50
	Vindlaster:			
16	Vindlast mot bro		0.45	0.45/1.50
17	Vindlast mot trafik		0.45	0.45/1.50
18	Överlast		1.13	1.13/1.50

Bruksgränstillstånd SLS enligt SS-EN 1990 avsnitt 6.5.3

Karakteristisk lastkombination SLS:K (ekvation 6.14b) :

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

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

Frekvent lastkombination SLS:F (ekvation 6.15b) :

$$E_{Sd}^{\max} = \sum_{j\geq 1}\cdot\eta_{\sup.j}\cdot G_{k,j} + P + \psi_{1,1}\cdot Q_{k,1} + \sum_{i>1}\cdot\psi_{2,i}\cdot Q_{k,i} = \psi\gamma_{SLS.F}^{\max}\cdot(\sum_{j\geq 1}G_{k,j} + P + \sum_{i\geq 1}Q_{k,j})$$

$$E_{Sd}^{\min} = \sum_{j\geq 1}\eta_{\inf.j}\cdot G_{k,j} + P + \psi_{1,1}\cdot Q_{k,1} + \sum_{i>1}\cdot\psi_{2,i}\cdot Q_{k,i} = \psi\gamma_{SLS.F}^{\min}\cdot(\sum_{j\geq 1}G_{k,j} + P + \sum_{i\geq 1}Q_{k,j})$$

Kvasipermanent lastkombination SLS:Q (ekvation 6.16b) :

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

$$E_{Sd}^{\min} = \sum_{j\geq 1}\eta_{\inf,j}\cdot G_{k,j} + P + \sum_{i\geq 1}\cdot\psi_{2,i}\cdot Q_{k,i} = \psi\gamma_{SLS.Q}^{\min}\cdot(\sum_{j\geq 1}G_{k,j} + P + \sum_{i\geq 1}Q_{k,j})$$

Lastkombination nr. 1 med huvudlasten : Lastsystem 1 (LM1)

Karakteristisk lastkombinatiom SLS-K.1 enligt ekvation 6.14b.

Frekvent lastkombinatiom SLS-F.1 enligt ekvation 6.15b.

Kvasipermanent lastkombinatiom SLS-K.1 enligt ekvation 6.16b.

Nr	Last		$\psi\gamma_{SLS\text{-}K.1}$	$\psi\gamma_{SLS\text{-}F.1}$	$\psi\gamma_{SLS\text{-}Q.1}$	Största last
	Permanenta laster					
1	Egentyngd	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
2	Beläggning	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
3	Överfyllnad	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
4	Jordtryck	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
5	Vattentryck	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
6	Stödförskjutning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
7	Krympning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
8	Spännkraft	max	1.00	1.00	1.00	
		min	1.00	1.00	1.00	
	Variabla laster					
	Lastsystem 1 (LM 1) :					
9	Utbredd last		1.00	ψ_1= 0.40	ψ_2= 0	X
	Snölast :					
14	Snölast		ψ_0= 0.70	ψ_2= 0.20	ψ_2= 0.20	
	Temperatur :					
15	Temperatur		ψ_0= 0.60	ψ_2= 0.50	ψ_2= 0.50	
	Vindlaster :					
16	Vindlast mot bro		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
17	Vindlast mot trafik		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
	Överlast :					
18	Överlast		ψ_0= 0.75	ψ_2= 0	ψ_2= 0	

Lastkombination nr. 2 med huvudlasten : Snölast

Karakteristisk lastkombinatiom SLS-K.2 enligt ekvation 6.14b.

Frekvent lastkombinatiom SLS-F.2 enligt ekvation 6.15b.

Kvasipermanent lastkombinatiom SLS-K.2 enligt ekvation 6.16b.

Nr	Last		$\psi\gamma_{SLS\text{-}K.2}$	$\psi\gamma_{SLS\text{-}F.2}$	$\psi\gamma_{SLS\text{-}Q.2}$	Största last
	Permanenta laster					
1	Egentyngd	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
2	Beläggning	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
3	Överfyllnad	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
4	Jordtryck	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
5	Vattentryck	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
6	Stödförskjutning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
7	Krympning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
8	Spännkraft	max	1.00	1.00	1.00	
		min	1.00	1.00	1.00	
	Variabla laster					
	Lastsystem 1 (LM 1) :					
9	Utbredd last		ψ_0= 0.40	ψ_2= 0	ψ_2= 0	
	Snölast :					
14	Snölast		1.00	ψ_1= 0.40	ψ_2= 0.20	X
	Temperatur :					
15	Temperatur		ψ_0= 0.60	ψ_2= 0.50	ψ_2= 0.50	
	Vindlaster :					
16	Vindlast mot bro		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
17	Vindlast mot trafik		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
	Överlast :					
18	Överlast		ψ_0= 0.75	ψ_2= 0	ψ_2= 0	

Lastkombination nr. 3 med huvudlasten : Temperatur

Karakteristisk lastkombinatiom SLS-K.3 enligt ekvation 6.14b.

Frekvent lastkombinatiom SLS-F.3 enligt ekvation 6.15b.

Kvasipermanent lastkombinatiom SLS-K.3 enligt ekvation 6.16b.

Nr	Last		$\psi\gamma_{SLS\text{-}K.3}$	$\psi\gamma_{SLS\text{-}F.3}$	$\psi\gamma_{SLS\text{-}Q.3}$	Största last
	Permanenta laster					
1	Egentyngd	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
2	Beläggning	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
3	Överfyllnad	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
4	Jordtryck	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
5	Vattentryck	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
6	Stödförskjutning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
7	Krympning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
8	Spännkraft	max	1.00	1.00	1.00	
		min	1.00	1.00	1.00	
	Variabla laster					
	Lastsystem 1 (LM 1) :					
9	Utbredd last		ψ_0= 0.40	ψ_2= 0	ψ_2= 0	
	Snölast :					
14	Snölast		ψ_0= 0.70	ψ_2= 0.20	ψ_2= 0.20	
	Temperatur :					
15	Temperatur		1.00	ψ_1= 0.60	ψ_2= 0.50	X
	Vindlaster :					
16	Vindlast mot bro		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
17	Vindlast mot trafik		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
	Överlast :					
18	Överlast		ψ_0= 0.75	ψ_2= 0	ψ_2= 0	

Lastkombination nr. 4 med huvudlasten : Vindlast

Karakteristisk lastkombinatiom SLS-K.4 enligt ekvation 6.14b.

Frekvent lastkombinatiom SLS-F.4 enligt ekvation 6.15b.

Kvasipermanent lastkombinatiom SLS-K.4 enligt ekvation 6.16b.

Nr	Last		$\psi\gamma_{SLS\text{-}K.4}$	$\psi\gamma_{SLS\text{-}F.4}$	$\psi\gamma_{SLS\text{-}Q.4}$	Största last
	Permanenta laster					
1	Egentyngd	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
2	Beläggning	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
3	Överfyllnad	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
4	Jordtryck	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
5	Vattentryck	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
6	Stödförskjutning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
7	Krympning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
8	Spännkraft	max	1.00	1.00	1.00	
		min	1.00	1.00	1.00	
	Variabla laster					
	Lastsystem 1 (LM 1) :					
9	Utbredd last		ψ_0= 0.40	ψ_2= 0	ψ_2= 0	
	Snölast :					
14	Snölast		ψ_0= 0.70	ψ_2= 0.20	ψ_2= 0.20	
	Temperatur :					
15	Temperatur		ψ_0= 0.60	ψ_2= 0.50	ψ_2= 0.50	
	Vindlaster :					
16	Vindlast mot bro		1.00	ψ_1= 0.20	ψ_2= 0	X
17	Vindlast mot trafik		1.00	ψ_1= 0.20	ψ_2= 0	X
	Överlast :					
18	Överlast		ψ_0= 0.75	ψ_2= 0	ψ_2= 0	

Lastkombination nr. 5 med huvudlasten : Överlast

Karakteristisk lastkombinatiom SLS-K.5 enligt ekvation 6.14b.

Frekvent lastkombinatiom SLS-F.5 enligt ekvation 6.15b.

Kvasipermanent lastkombinatiom SLS-K.5 enligt ekvation 6.16b.

Nr	Last		$\psi\gamma_{SLS\text{-}K.5}$	$\psi\gamma_{SLS\text{-}F.5}$	$\psi\gamma_{SLS\text{-}Q.5}$	Största last
	Permanenta laster					
1	Egentyngd	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
2	Beläggning	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
3	Överfyllnad	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
4	Jordtryck	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
5	Vattentryck	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
6	Stödförskjutning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
7	Krympning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
8	Spännkraft	max	1.00	1.00	1.00	
		min	1.00	1.00	1.00	
	Variabla laster					
	Lastsystem 1 (LM 1) :					
9	Utbredd last		ψ_0= 0.40	ψ_2= 0	ψ_2= 0	
	Snölast :					
14	Snölast		ψ_0= 0.70	ψ_2= 0.20	ψ_2= 0.20	
	Temperatur :					
15	Temperatur		ψ_0= 0.60	ψ_2= 0.50	ψ_2= 0.50	
	Vindlaster :					
16	Vindlast mot bro		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	X
17	Vindlast mot trafik		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	X
	Överlast :					
18	Överlast		1.00	ψ_1= 0.75	ψ_2= 0	X

Lastkombination nr. 6 med huvudlasten : Lastsystem 2 (LM 2)

Karakteristisk lastkombinatiom SLS-K.6 enligt ekvation 6.14b.

Frekvent lastkombinatiom SLS-F.6 enligt ekvation 6.15b.

Kvasipermanent lastkombinatiom SLS-K.6 enligt ekvation 6.16b.

Nr	Last		$\psi\gamma_{SLS\text{-}K.6}$	$\psi\gamma_{SLS\text{-}F.6}$	$\psi\gamma_{SLS\text{-}Q.6}$	Största last
	Permanenta laster					
1	Egentyngd	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
2	Beläggning	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
3	Överfyllnad	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
4	Jordtryck	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
5	Vattentryck	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
6	Stödförskjutning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
7	Krympning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
8	Spännkraft	max	1.00	1.00	1.00	
		min	1.00	1.00	1.00	
	Variabla laster					
	Lastsystem 2 (LM 2) :					
10	Enstaka axellast		1.00	ψ_1= 0	ψ_2= 0	X
	Snölast :					
14	Snölast		ψ_0= 0.70	ψ_2= 0.20	ψ_2= 0.20	
	Temperatur :					
15	Temperatur		ψ_0= 0.60	ψ_2= 0.50	ψ_2= 0.50	
	Vindlaster :					
16	Vindlast mot bro		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
17	Vindlast mot trafik		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
	Överlast :					
18	Överlast		ψ_0= 0.75	ψ_2= 0	ψ_2= 0	

Lastkombination nr. 7 med huvudlasten : Lastsystem 3 (LM 3)

Karakteristisk lastkombinatiom SLS-K.7 enligt ekvation 6.14b.

Frekvent lastkombinatiom SLS-F.7 enligt ekvation 6.15b.

Kvasipermanent lastkombinatiom SLS-K.7 enligt ekvation 6.16b.

Nr	Last		$\psi\gamma_{SLS\text{-}K.7}$	$\psi\gamma_{SLS\text{-}F.7}$	$\psi\gamma_{SLS\text{-}Q.7}$	Största last
	Permanenta laster					
1	Egentyngd	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
2	Beläggning	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
3	Överfyllnad	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
4	Jordtryck	max	η_{sup}= 1.10	η_{sup}= 1.10	η_{sup}= 1.10	
		min	η_{inf}= 0.90	η_{inf}= 0.90	η_{inf}= 0.90	
5	Vattentryck	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
6	Stödförskjutning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
7	Krympning	max	η_{sup}= 1.00	η_{sup}= 1.00	η_{sup}= 1.00	
		min	η_{inf}= 1.00	η_{inf}= 1.00	η_{inf}= 1.00	
8	Spännkraft	max	1.00	1.00	1.00	
		min	1.00	1.00	1.00	
	Variabla laster					
	Lastsystem 3 (LM 3) :					
11	Servicefordon		1.00	ψ_1= 0	ψ_2= 0	X
12	Bromskraft		1.00	ψ_1= 0	ψ_2= 0	X
13	Sidokraft		1.00	ψ_1= 0	ψ_2= 0	X
	Snölast :					
14	Snölast		ψ_0= 0.70	ψ_2= 0.20	ψ_2= 0.20	
	Temperatur :					
15	Temperatur		ψ_0= 0.60	ψ_2= 0.50	ψ_2= 0.50	
	Vindlaster :					
16	Vindlast mot bro		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
17	Vindlast mot trafik		ψ_0= 0.30	ψ_2= 0	ψ_2= 0	
	Överlast :					
18	Överlast		ψ_0= 0.75	ψ_2= 0	ψ_2= 0	

Förenklad metod :

Karakteristisk lastkombination SLS-K innebär enveloppet för lastkombinationer SLS-K.1, SLS-K.2, ... SLS-K.7.
Frekvent lastkombination SLS-F innebär enveloppet för lastkombinationer SLS-F.1, SLS-F.2, ... SLS-F.7.
Kvasipermanent lastkombination SLS-Q innebär enveloppet för lastkombinationer SLS-Q.1, SLS-Q.2, ... SLS-Q.7.

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	Utbredd last		0.40/1.00	0/0.40	0
	Lastmodell LM 2 :				
10	Enstaka axellast		0/1.00	0	0
	Lastmodell LM 3 :				
11	Servicefordon		0/1.00	0	0
12	Bromskraft		0/1.00	0	0
13	Sidokraft		0/1.00	0	0
14	Snölast		0.70/1.00	0.20/0.40	0.20
15	Temperatur		0.60/1.00	0.50/0.60	0.50
	Vindlaster:				
16	Vindlast mot bro		0.30/1.00	0/0.20	0
17	Vindlast mot trafik		0.30/1.00	0/0.20	0
18	Överlast		0.75/1.00	0/0.75	0

Olyckslastfall EXC enligt SS-EN 1990 avsnitt 6.4.3.3

Exceptionell lastkombination EXC (ekvation 6.11a) :

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

Nr	Last		$\psi\gamma_{EXC}$
	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	Utbredd last		0/0.40
	Lastmodell LM 2 :		
10	Enstaka axellast		0
	Lastmodell LM 3 :		
11	Renhållningsfordon		0
12	Bromskraft		0
13	Sidokraft		0
14	Snölast		0.20/0.40
15	Temperatur		0.50/0.60
	Vindlaster:		
16	Vindlast mot bro		0/0.20
17	Vindlast mot trafik		0/0.20
18	Överlast		0/0.75
19	Olyckslast (A_d)		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
97	0.0	-1.0	-0.6
98	1.5	-1.0	-0.6
99	47.5	-1.0	-0.6
100	49.0	-1.0	-0.6
107	10.0	-1.0	-0.6
108	17.5	-1.0	-0.6
109	18.0	-1.0	-0.6
110	24.5	-1.0	-0.6
113	31.5	-1.0	-0.6
114	39.0	-1.0	-0.6
117	31.0	-1.0	-0.6
118	1.5	-1.0	-1.0
119	24.5	-1.0	-1.0
120	47.5	-1.0	-1.0
121	1.5	1.0	-1.0
122	24.5	1.0	-1.0
123	47.5	1.0	-1.0
124	0.0	1.0	-0.6
125	1.5	1.0	-0.6
126	47.5	1.0	-0.6
127	49.0	1.0	-0.6
128	10.0	1.0	-0.6
129	17.5	1.0	-0.6
130	18.0	1.0	-0.6
131	24.5	1.0	-0.6
132	31.5	1.0	-0.6
133	39.0	1.0	-0.6
134	31.0	1.0	-0.6
135	1.5	0.0	-1.0
136	47.5	0.0	-1.0
137	24.5	0.0	-1.0
141	24.5	0.0	-7.0
145	24.5	0.0	-7.8
146	10.0	-1.0	-0.4
147	10.0	1.0	-0.4
148	10.0	-1.0	-1.0
149	10.0	1.0	-1.0
150	10.0	0.4	-0.4
151	10.0	-0.4	-0.4
152	18.0	-1.0	-1.0
154	18.0	-1.0	-0.4
155	18.0	1.0	-1.0
157	18.0	1.0	-0.4
158	18.0	0.4	-0.4
159	18.0	-0.4	-0.4
160	31.0	-1.0	-1.0
162	31.0	-1.0	-0.4
163	31.0	1.0	-1.0
165	31.0	1.0	-0.4
166	31.0	0.4	-0.4
167	31.0	-0.4	-0.4
168	39.0	-1.0	-1.0
170	39.0	-1.0	-0.4
171	39.0	1.0	-1.0
173	39.0	1.0	-0.4

174	39.0	0.4	-0.4
175	39.0	-0.4	-0.4
176	1.5	-1.0	-0.4
177	1.5	1.0	-0.4
179	24.5	1.0	-0.4
181	24.5	-1.0	-0.4
183	47.5	1.0	-0.4
185	47.5	-1.0	-0.4
186	1.5	-1.0	0.0
187	10.0	-1.0	0.0
188	1.5	1.0	0.0
189	10.0	1.0	0.0
191	17.5	-1.0	0.0
192	17.5	1.0	0.0
193	0.0	-1.0	0.0
195	18.0	-1.0	0.0
196	24.5	-1.0	0.0
197	31.5	-1.0	0.0
198	39.0	-1.0	0.0
199	47.5	-1.0	0.0
200	31.0	-1.0	0.0
202	0.0	1.0	0.0
203	24.5	1.0	0.0
204	18.0	1.0	0.0
205	39.0	1.0	0.0
206	31.5	1.0	0.0
207	47.5	1.0	0.0
208	31.0	1.0	0.0
210	49.0	-1.0	0.0
211	49.0	1.0	0.0
216	1.5	2.0	0.0
217	10.0	2.0	0.0
219	17.5	2.0	0.0
221	0.0	2.0	0.0
224	24.5	2.0	0.0
225	18.0	2.0	0.0
228	39.0	2.0	0.0
229	31.5	2.0	0.0
231	47.5	2.0	0.0
233	31.0	2.0	0.0
235	49.0	2.0	0.0
240	1.5	-2.0	0.0
241	10.0	-2.0	0.0
243	17.5	-2.0	0.0
245	0.0	-2.0	0.0
248	18.0	-2.0	0.0
249	24.5	-2.0	0.0
252	31.5	-2.0	0.0
253	39.0	-2.0	0.0
255	47.5	-2.0	0.0
257	31.0	-2.0	0.0
259	49.0	-2.0	0.0
260	0.0	0.0	0.0
266	15.0	-1.0	0.0
267	15.0	1.0	0.0
269	15.0	2.0	0.0
271	15.0	-2.0	0.0
276	34.0	-1.0	0.0
277	34.0	1.0	0.0
279	34.0	2.0	0.0

281	34.0	-2.0	0.0
283	15.0	-1.0	-0.6
285	15.0	1.0	-0.6
287	34.0	-1.0	-0.6
289	34.0	1.0	-0.6
290	1.5	-1.0	2.0
292	1.5	1.0	2.0
294	0.0	-1.0	2.0
298	47.5	-1.0	2.0
300	0.0	1.0	2.0
303	47.5	1.0	2.0
310	49.0	-1.0	2.0
311	49.0	1.0	2.0
312	1.5	2.0	2.0
315	0.0	2.0	2.0
320	47.5	2.0	2.0
322	49.0	2.0	2.0
323	1.5	-2.0	2.0
326	0.0	-2.0	2.0
331	47.5	-2.0	2.0
333	49.0	-2.0	2.0
342	1.5	0.0	2.0
344	0.0	0.0	2.0
348	47.5	0.0	2.0
352	49.0	0.0	2.0
356	24.5	0.0	2.0
359	24.5	-1.0	2.0
360	24.5	1.0	2.0
362	24.5	2.0	2.0
364	24.5	-2.0	2.0
365	-2.0	1.1	2.0
369	50.5	1.1	2.0
370	-2.0	-1.1	2.0
371	50.5	-1.1	2.0
372	-1.5	1.1	2.0
373	-1.0	1.1	2.0
374	-0.5	1.1	2.0
375	0.0	1.1	2.0
376	0.5	1.1	2.0
377	1.0	1.1	2.0
378	1.5	1.1	2.0
379	2.0	1.1	2.0
380	2.5	1.1	2.0
381	3.0	1.1	2.0
382	3.5	1.1	2.0
383	4.0	1.1	2.0
384	4.5	1.1	2.0
385	5.0	1.1	2.0
386	5.5	1.1	2.0
387	6.0	1.1	2.0
388	6.5	1.1	2.0
389	7.0	1.1	2.0
390	7.5	1.1	2.0
391	8.0	1.1	2.0
392	8.5	1.1	2.0
393	9.0	1.1	2.0
394	9.5	1.1	2.0
395	10.0	1.1	2.0
396	10.5	1.1	2.0
397	11.0	1.1	2.0

398	11.5	1.1	2.0
399	12.0	1.1	2.0
400	12.5	1.1	2.0
401	13.0	1.1	2.0
402	13.5	1.1	2.0
403	14.0	1.1	2.0
404	14.5	1.1	2.0
405	15.0	1.1	2.0
406	15.5	1.1	2.0
407	16.0	1.1	2.0
408	16.5	1.1	2.0
409	17.0	1.1	2.0
410	17.5	1.1	2.0
411	18.0	1.1	2.0
412	18.5	1.1	2.0
413	19.0	1.1	2.0
414	19.5	1.1	2.0
415	20.0	1.1	2.0
416	20.5	1.1	2.0
417	21.0	1.1	2.0
418	21.5	1.1	2.0
419	22.0	1.1	2.0
420	22.5	1.1	2.0
421	23.0	1.1	2.0
422	23.5	1.1	2.0
423	24.0	1.1	2.0
424	24.5	1.1	2.0
425	25.0	1.1	2.0
426	25.5	1.1	2.0
427	26.0	1.1	2.0
428	26.5	1.1	2.0
429	27.0	1.1	2.0
430	27.5	1.1	2.0
431	28.0	1.1	2.0
432	28.5	1.1	2.0
433	29.0	1.1	2.0
434	29.5	1.1	2.0
435	30.0	1.1	2.0
436	30.5	1.1	2.0
437	31.0	1.1	2.0
438	31.5	1.1	2.0
439	32.0	1.1	2.0
440	32.5	1.1	2.0
441	33.0	1.1	2.0
442	33.5	1.1	2.0
443	34.0	1.1	2.0
444	34.5	1.1	2.0
445	35.0	1.1	2.0
446	35.5	1.1	2.0
447	36.0	1.1	2.0
448	36.5	1.1	2.0
449	37.0	1.1	2.0
450	37.5	1.1	2.0
451	38.0	1.1	2.0
452	38.5	1.1	2.0
453	39.0	1.1	2.0
454	39.5	1.1	2.0
455	40.0	1.1	2.0
456	40.5	1.1	2.0
457	41.0	1.1	2.0

458	41.5	1.1	2.0
459	42.0	1.1	2.0
460	42.5	1.1	2.0
461	43.0	1.1	2.0
462	43.5	1.1	2.0
463	44.0	1.1	2.0
464	44.5	1.1	2.0
465	45.0	1.1	2.0
466	45.5	1.1	2.0
467	46.0	1.1	2.0
468	46.5	1.1	2.0
469	47.0	1.1	2.0
470	47.5	1.1	2.0
471	48.0	1.1	2.0
472	48.5	1.1	2.0
473	49.0	1.1	2.0
474	49.5	1.1	2.0
475	50.0	1.1	2.0
476	-1.5	-1.1	2.0
477	-1.0	-1.1	2.0
478	-0.5	-1.1	2.0
479	0.0	-1.1	2.0
480	0.5	-1.1	2.0
481	1.0	-1.1	2.0
482	1.5	-1.1	2.0
483	2.0	-1.1	2.0
484	2.5	-1.1	2.0
485	3.0	-1.1	2.0
486	3.5	-1.1	2.0
487	4.0	-1.1	2.0
488	4.5	-1.1	2.0
489	5.0	-1.1	2.0
490	5.5	-1.1	2.0
491	6.0	-1.1	2.0
492	6.5	-1.1	2.0
493	7.0	-1.1	2.0
494	7.5	-1.1	2.0
495	8.0	-1.1	2.0
496	8.5	-1.1	2.0
497	9.0	-1.1	2.0
498	9.5	-1.1	2.0
499	10.0	-1.1	2.0
500	10.5	-1.1	2.0
501	11.0	-1.1	2.0
502	11.5	-1.1	2.0
503	12.0	-1.1	2.0
504	12.5	-1.1	2.0
505	13.0	-1.1	2.0
506	13.5	-1.1	2.0
507	14.0	-1.1	2.0
508	14.5	-1.1	2.0
509	15.0	-1.1	2.0
510	15.5	-1.1	2.0
511	16.0	-1.1	2.0
512	16.5	-1.1	2.0
513	17.0	-1.1	2.0
514	17.5	-1.1	2.0
515	18.0	-1.1	2.0
516	18.5	-1.1	2.0
517	19.0	-1.1	2.0

518	19.5	-1.1	2.0
519	20.0	-1.1	2.0
520	20.5	-1.1	2.0
521	21.0	-1.1	2.0
522	21.5	-1.1	2.0
523	22.0	-1.1	2.0
524	22.5	-1.1	2.0
525	23.0	-1.1	2.0
526	23.5	-1.1	2.0
527	24.0	-1.1	2.0
528	24.5	-1.1	2.0
529	25.0	-1.1	2.0
530	25.5	-1.1	2.0
531	26.0	-1.1	2.0
532	26.5	-1.1	2.0
533	27.0	-1.1	2.0
534	27.5	-1.1	2.0
535	28.0	-1.1	2.0
536	28.5	-1.1	2.0
537	29.0	-1.1	2.0
538	29.5	-1.1	2.0
539	30.0	-1.1	2.0
540	30.5	-1.1	2.0
541	31.0	-1.1	2.0
542	31.5	-1.1	2.0
543	32.0	-1.1	2.0
544	32.5	-1.1	2.0
545	33.0	-1.1	2.0
546	33.5	-1.1	2.0
547	34.0	-1.1	2.0
548	34.5	-1.1	2.0
549	35.0	-1.1	2.0
550	35.5	-1.1	2.0
551	36.0	-1.1	2.0
552	36.5	-1.1	2.0
553	37.0	-1.1	2.0
554	37.5	-1.1	2.0
555	38.0	-1.1	2.0
556	38.5	-1.1	2.0
557	39.0	-1.1	2.0
558	39.5	-1.1	2.0
559	40.0	-1.1	2.0
560	40.5	-1.1	2.0
561	41.0	-1.1	2.0
562	41.5	-1.1	2.0
563	42.0	-1.1	2.0
564	42.5	-1.1	2.0
565	43.0	-1.1	2.0
566	43.5	-1.1	2.0
567	44.0	-1.1	2.0
568	44.5	-1.1	2.0
569	45.0	-1.1	2.0
570	45.5	-1.1	2.0
571	46.0	-1.1	2.0
572	46.5	-1.1	2.0
573	47.0	-1.1	2.0
574	47.5	-1.1	2.0
575	48.0	-1.1	2.0
576	48.5	-1.1	2.0
577	49.0	-1.1	2.0

578	49.5	-1.1	2.0
579	50.0	-1.1	2.0
580	4.5	-2.0	-0.6
581	20.5	-2.0	-0.6
582	28.5	-2.0	-0.6
583	44.5	-2.0	-0.6
587	4.5	2.0	-0.6
591	20.5	2.0	-0.6
593	28.5	2.0	-0.6
597	44.5	2.0	-0.6
598	22.5	1.0	-0.6
599	22.5	-1.0	-0.6
600	26.5	-1.0	-0.6
601	26.5	1.0	-0.6
602	22.5	2.0	0.0
603	22.5	1.0	0.0
604	22.5	-1.0	0.0
605	22.5	-2.0	0.0
606	26.5	-2.0	0.0
607	26.5	-1.0	0.0
608	26.5	1.0	0.0
609	26.5	2.0	0.0

2. Lines

Line	Points	Line	Points
125	97,98	126	99,100
131	98,107	133	108,109
138	114,99	142	117,113
143	124,125	144	126,127
145	125,128	147	129,130
150	133,126	152	134,132
154	121,135	155	135,118
157	123,136	158	136,120
160	122,137	161	137,119
163	137,141	165	141,145
166	148,107	167	107,146
168	149,128	169	128,147
171	147,150	172	150,151
173	151,146	174	149,150
175	148,151	176	152,109
177	109,154	178	155,130
179	130,157	180	157,158
181	158,159	182	159,154
183	155,158	184	152,159
185	160,117	186	117,162
187	163,134	188	134,165
189	165,166	190	166,167
191	167,162	192	163,166
193	160,167	194	168,114
195	114,170	196	171,133
197	133,173	198	173,174
199	174,175	200	175,170
201	171,174	202	168,175
203	125,177	204	98,176
205	176,177	206	131,179
207	110,181	208	181,179
209	126,183	210	99,185
211	185,183	212	186,187
213	188,189	214	186,188
215	187,189	218	193,186
221	198,199	223	188,202
226	207,205	228	191,195
229	200,197	230	204,192
231	206,208	232	199,210
233	211,207	235	191,192
236	195,204	237	196,203
239	200,208	241	197,206
243	198,205	245	199,207
247	210,211	248	193,202
251	216,217	252	188,216
253	189,217	256	192,219
258	216,221	259	202,221
262	203,224	263	204,225
266	205,228	267	206,229
269	231,228	270	207,231
273	208,233	275	225,219
277	229,233	279	235,231
280	211,235	283	240,241
284	186,240	285	187,241
288	191,243	290	245,240
291	193,245	294	195,248

295	196,249	298	197,252
299	198,253	301	253,255
302	199,255	305	200,257
307	243,248	309	257,252
311	255,259	312	210,259
315	266,267	316	187,266
317	189,267	319	267,269
320	217,269	322	266,271
323	241,271	327	266,191
328	267,192	331	269,219
334	271,243	337	276,277
338	198,276	339	205,277
341	277,279	342	228,279
344	276,281	345	253,281
349	276,197	350	277,206
353	279,229	356	281,252
357	107,283	358	128,285
359	283,108	360	285,129
361	287,114	362	289,133
363	113,287	364	132,289
494	130,598	495	598,131
496	109,599	497	599,110
498	110,600	499	600,117
500	131,601	501	601,134
510	249,606	517	609,224
520	603,602	523	604,603
525	605,604	526	605,249
528	196,604	531	203,603
534	224,602	536	606,607
537	607,196	539	607,608
540	608,203	542	608,609
543	248,605	545	604,195
548	603,204	551	602,225
552	606,257	554	200,607
557	208,608	560	233,609

3. Surfaces

Surface	Lines	Surface	Lines
1	212,215,213,214	4	228,236,230,235
6	229,241,231,239	8	221,245,226,243
9	232,247,233,245	10	218,214,223,248
21	213,253,251,252	23	223,252,258,259
26	226,270,269,266	28	230,263,275,256
29	231,267,277,273	30	233,280,279,270
41	283,285,212,284	43	290,284,218,291
46	301,302,221,299	48	307,294,228,288
49	309,298,229,305	50	311,312,232,302
54	316,315,317,215	55	317,319,320,253
56	323,322,316,285	60	327,235,328,315
61	328,256,331,319	62	334,288,327,322
66	338,243,339,337	67	339,266,342,341
68	345,299,338,344	72	349,337,350,241
73	350,341,353,267	74	356,344,349,298
78	526,295,528,525	79	528,237,531,523
80	531,262,534,520	81	510,536,537,295
82	537,539,540,237	83	540,542,517,262
84	543,525,545,294	85	545,523,548,236
86	548,520,551,263	87	552,305,554,536
88	554,239,557,539	89	557,273,560,542

4. MESH:Point

Attribute: 5 Title: Joint 1
Sub Type = Point Mesh Element Type = JSH4

DefinedByName

false

Assignment to Points: Beta angle = 0.0, Mesh from master to slave
118T123

5. MESH:Line

Attribute: 1 Title: BEAM x 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
125;126;143;144;172T199I9

Attribute: 2 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	2	None	THY THZ

Assignment to Lines: Beta angle = 0.0
173T200I9

Attribute: 3 Title: BEAM x 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
133;142;147;152;154;155;157;158;160;161;165T169;176T179;185T188;194T197;203;204;206;207;209;210

Attribute: 4 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	2	THY THZ	None

Assignment to Lines: Beta angle = 0.0
171;174;175;180;183;184;189;192;193;198;201;202

Attribute: 12 Title: BEAM x 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
131T145I7;150

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

Mesh spacing	**Nr. of elements**	**Start node end releases:**	**End node end releases:**
Uniform	4	None	None

Assignment to Lines: Beta angle = 0.0
163;205;208;211;359;360;363;364;495;497;498;500

Attribute: 18 Title: BEAM x 10
Sub Type = Line Mesh Element Type = BMI21

Mesh spacing	**Nr. of elements**	**Start node end releases:**	**End node end releases:**
Uniform	10	None	None

Assignment to Lines: Beta angle = 0.0
357;358;361;362;494;496;499;501

6. MESH:Surface

xDivisions	Number of divisions in x
yDivisions	Number of divisions in y
transition	Transition mesh
allowIrregular	Allow irregular mesh
DefinedByName	Element defined by name

Attribute: 6 Title: Element 2 x 2
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	2	2	true	true	false

Assignment to Surfaces:
23;30;43;50

Attribute: 7 Title: Element 14 x 2
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	14	2	true	true	false

Assignment to Surfaces:
21;26;41;46

Attribute: 8 Title: Element 14 x 4
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	14	4	true	true	false

Assignment to Surfaces:
1;8

Attribute: 9 Title: Element 2 x 4
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	2	4	true	true	false

Assignment to Surfaces:
9;10

Attribute: 10 Title: Element 1 x 2
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	1	2	true	true	false

Assignment to Surfaces:
28;29;48;49

Attribute: 11 Title: Element 1 x 4
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	1	4	true	true	false

Assignment to Surfaces:
4;6

Attribute: 13 Title: Element 4 x 2
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	4	2	true	true	false

Assignment to Surfaces:
61;62;73;74;78;80;81;83

Attribute: 15 Title: Element 4 x 4
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	4	4	true	true	false

Assignment to Surfaces:
60;72;79;82

Attribute: 16 Title: Element 10 x 2
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	10	2	true	true	false

Assignment to Surfaces:
55;56;67;68;84;86;87;89

Attribute: 17 Title: Element 10 x 4
Sub Type = Surface Mesh Element Type = QTS4

size	xDivisions	yDivisions	transition	allowIrregular	DefinedByName
0.0	10	4	true	true	false

Assignment to Surfaces:
54;66;85;88

7. Geometric : Line

7.1 Section Property Calculator

elementType	Element type
isNodal	Are properties specified about nodal line? (true/false)
A	Cross section area
Iyy	Moment of inertia about y
Izz	Moment of inertia about z
Iyz	Product moment of inertia
J	Torsional constant
ez	Eccentricity in local z direction
ey	Eccentricity in local y direction
Asz	Effective shear area in local z direction
Asy	Effective shear area in local y direction
Ew	Effective width
Ap	Plastic area
Zpy	Plastic modulus for bending about y
Zpz	Plastic modulus for bending about z
yp	Plastic neutral axis, distance from centroid along y axis
zp	Plastic neutral axis, distance from centroid along z axis
Zpt	Plastic torsional section modulus

Attribute: 2 Title: Column 2:1 (800 x 2600 major y)
Sub Type = Line Geometric
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

Property	Value
A	2.080
Iyy	1.172
Izz	0.111
Iyz	0.000
J	0.358
ez	0.000
ey	0.000
Asz	1.733
Asy	1.733
Ew	0.000
Ap	2.080
Zpy	0.000
Zpz	0.000
yp	0.000
zp	0.000
Zpt	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
163

Attribute: 3 Title: Rigid beam

Sub Type = Line Geometric
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

Property	Value
A	1.0
Iyy	1.0
Izz	1.0
Iyz	0.0
J	0.0
ez	0.0
ey	0.0
Asz	1.0
Asy	1.0
Ew	0.0

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
154;155;157;158;160;161;166T169;176T179;185T188;194T197;203;204;206;207;209;210

7.2 Section Library

Cw	Warping torsional constant
yo	Shear centre about Y axis
zo	Shear centre about Z axis

Attribute: 5 Title: UPE 300 (UPE 300 major y)

Sub Type = Line Geometric
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

Property	Value
A	0.006
Iyy	0.000
Izz	0.000
Iyz	0.000
J	0.000
ez	0.000
ey	0.000
Asz	0.003
Asy	0.003
Ew	0.000
Ap	0.006
Zpy	0.000
Zpz	0.000
yp	0.000
zp	0.000
Zpt	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
171T173;180T182;189T191;198T200

Attribute: 6 Title: L 100 x 100 x 10 (100x100x10 EA major y)

Sub Type = Line Geometric
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

Property	Value
A	0.002
Iyy	0.000
Izz	0.000
Iyz	0.000
J	0.000
ez	0.000
ey	0.000
Asz	0.001
Asy	0.001
Ew	0.000
Ap	0.002
Zpy	0.000
Zpz	0.000
yp	0.019
zp	-0.019
Zpt	0.000
Cw	0.000
yo	0.022
zo	-0.022

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
174;175;183;184;192;193;201;202

Attribute: 8 Title: HEB 500 (HE 500 B major y)

Sub Type = Line Geometric
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

Property	Value
A	0.024
Iyy	0.001
Izz	0.000
Iyz	0.000
J	0.000
ez	0.000
ey	0.000
Asz	0.007
Asy	0.015
Ew	0.000
Ap	0.024
Zpy	0.005
Zpz	0.001
yp	0.000
zp	0.000
Zpt	0.000
Cw	0.000
yo	0.000
zo	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
205T211I3

7.3 Imported section properties – Point EC 4

Attribute: 9 Title: A__F1

Sub Type = Line Geometric
Assigned in: Stage III; Stage II; Stage I

Property	Value
A	0.025
Iyy	0.003
Izz	0.000
Iyz	0.000
J	0.000
ez	0.050
ey	0.000
Asz	0.008
Asy	0.017
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
125;131;143;145;357T360

Attribute: 10 Title: A__F2a

Sub Type = Line Geometric
Assigned in: Stage III; Stage II; Drift-P

Property	Value
A	0.053
Iyy	0.008
Izz	0.008
Iyz	0.000
J	0.000
ez	-0.276
ey	0.000
Asz	0.008
Asy	0.017
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
125;131;143;145;357T360

Attribute: 13 Title: A__F3

Sub Type = Line Geometric
Assigned in: Drift-V

Property	Value
A	0.110
Iyy	0.011
Izz	0.026
Iyz	0.000
J	0.001
ez	-0.425
ey	0.000
Asz	0.008
Asy	0.017
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
125;131;143;145;357T360

Attribute: 15 Title: B __F1

Sub Type = Line Geometric
Assigned in: Stage III; Stage II; Stage I

Property	Value
A	0.028
Iyy	0.004
Izz	0.000
Iyz	0.000
J	0.000
ez	0.081
ey	0.000
Asz	0.008
Asy	0.020
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
133;142;147;152;494T501

Attribute: 16 Title: B __F2a

Sub Type = Line Geometric
Assigned in: Drift-P

Property	Value
A	0.056
Iyy	0.010
Izz	0.008
Iyz	0.000
J	0.000
ez	-0.246
ey	0.000
Asz	0.008
Asy	0.020
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
133;142;147;152;494;496;499;501

Attribute: 19 Title: B __F3

Sub Type = Line Geometric
Assigned in: Drift-V

Property	Value
A	0.112
Iyy	0.013
Izz	0.026
Iyz	0.000
J	0.001
ez	-0.407
ey	0.000
Asz	0.008
Asy	0.020
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
133;142;147;152;494;496;499;501

Attribute: 20 Title: B __cracked
Sub Type = Line Geometric
Assigned in: Drift-V; Drift-P

Property	Value
A	0.031
Iyy	0.005
Izz	0.000
Iyz	0.000
J	0.000
ez	0.000
ey	0.000
Asz	0.008
Asy	0.020
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
495;497;498;500

Attribute: 21 Title: C__F1
Sub Type = Line Geometric
Assigned in: Stage II; Stage I

Property	Value
A	0.025
Iyy	0.003
Izz	0.000
Iyz	0.000
J	0.000
ez	0.050
ey	0.000
Asz	0.008
Asy	0.017
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
126;138;144;150;361T364

Attribute: 22 Title: C__F2a

Sub Type = Line Geometric
Assigned in: Stage III; Drift-P

Property	Value
A	0.053
Iyy	0.008
Izz	0.008
Iyz	0.000
J	0.000
ez	-0.276
ey	0.000
Asz	0.008
Asy	0.017
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
126;138;144;150;361T364

Attribute: 25 Title: C__F3

Sub Type = Line Geometric
Assigned in: Drift-V

Property	Value
A	0.110
Iyy	0.011
Izz	0.026
Iyz	0.000
J	0.001
ez	-0.425
ey	0.000
Asz	0.008
Asy	0.017
Ew	0.000

elementType	isNodal
"3D Thick Beam"	false

Assignment to Lines:
126;138;144;150;361;362

7.4 Multiple Varying Geometry using - Section Property Calculator

elementType	Element type
isNodal	Are properties specified about nodal line? (true/false)
isSpecifyInterp	Interpolation order specified
isEqualSpacing	Equal spacing assumed
isSymmetry	Symmetry
distanceType	Distance type
vAlign	Vertical alignment eccentricity
hAlign	Horizontal alignment eccentricity
alignToRow	Section to which others are aligned
vAlignType	Vertical alignment type
hAlignType	Horizontal alignment type
interpMethod	Interpolation method
A	Cross section area
Iyy	Moment of inertia about y
Izz	Moment of inertia about z
Iyz	Product moment of inertia
J	Torsional constant
ez	Eccentricity in local z direction
ey	Eccentricity in local y direction
Asz	Effective shear area in local z direction
Asy	Effective shear area in local y direction
Ew	Effective width
Ap	Plastic area
Zpy	Plastic modulus for bending about y
Zpz	Plastic modulus for bending about z
yp	Plastic neutral axis, distance from centroid along y axis
zp	Plastic neutral axis, distance from centroid along z axis
Zpt	Plastic torsional section modulus
name	Name
distanceAlongBeam	Distance along beam
interpolationOrder	Interpolation order

Attribute: 4 Title: Column 2:2 (Varying - 2 sections)
Sub Type = Multiple Varying Geometric
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

Cross Section	name	interpolationOrder	distanceAlongBeam
Section 1	"800 x 2600"	"Constant"	0.0
Section 2	"1330 x 3130"	"Linear"	0.8

Property	Section 1	Section 2
A	2.080	4.163
Iyy	1.172	3.399
Izz	0.111	0.614
Iyz	0.000	0.000
J	0.358	1.799
ez	0.000	0.000
ey	0.000	0.000
Asz	1.733	3.469
Asy	1.733	3.469
Ew	0.000	0.000
Ap	2.080	4.163
Zpy	0.000	0.000
Zpz	0.000	0.000
yp	0.000	0.000
zp	0.000	0.000
Zpt	0.000	0.000

elementType	isNodal	isSpecifyInterp	isEqualSpacing	isSymmetry	distanceType
"3D Thick Beam"	false	true	false	false	"Parametric"

8. Geometric : Surface

t	Thickness
ez	Eccentricity in local z direction

Attribute: 26 Title: t = 249 mm
Sub Type = Surface Geometric
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

t	**ez**
0.249	0.0

Assignment to Surfaces:
1;4;6;8;9;10;21;23;26;28;29;30;41;43;46;48;49;50;54T56;60T62;66T68;72T74;78T89

9. Isotropic material

E	Young's modulus
nu	Poisson's ratio
rho	Density
alpha	Coefficient of thermal expansion

Attribute: 1 Title: Steel

Sub Type = Isotropic Material
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

E	nu	rho	alpha
210000000.0	0.3	7.8	0.0

Assignment to Lines:
125;126;131;133;138;142;143T145;147;150;152;154;155;157;158;166;167T169;171T211;357T364;494T501

Attribute: 10 Title: Isotrop concrete

Sub Type = Isotropic Material
Assigned in: Stage III; Stage II; Drift-P; Drift-V

E	nu	rho
33 000 000.0	0.2	2.5

Assignment to Lines:
160;161;163;165

10. Orthotropic material

Gyz	Shear modulus in yz
Gzx	Shear modulus in xz
ayz	Coefficient of thermal expansion in yz
azx	Coefficient of thermal expansion in xz
Gxy	Shear modulus in xy
axy	Coefficient of thermal expansion in yz
Ex	Young's modulus in x
Ey	Young's modulus in y
nuxy	Poisson's ration in xy
angle	Angle of othotropy
rho	Density
ax	Coefficient of thermal expansion in x
ay	Coefficient of thermal expansion in y
ar	Mass Rayleigh damping constant
br	Stiffness Rayleigh damping constant

Attribute: 6 Title: Ortotrop concrete
Sub Type = Orthotropic Material
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

Gyz	**Gzx**	**ayz**	**azx**	**Gxy**	**axy**
14000000.0	14000.0	0.0	0.0	14000.0	0.0
Ex	**Ey**	**nuxy**	**angle**	**rho**	**ax**
33000.0	33000000.0	0.0	0.0	0.0	0.0
ay	**ar**	**br**			
0.0	0.0	0.0			

Assignment to Surfaces:
1;4;6;8;9;10;21;23;26;28;29;30;41;43;46;48;49;50;54T56;60T62;66T68;72T74;78T89

11. Joint material

nDOF	Number of degrees of freedom
JointType	Joint type
Assignment	Assignment type
K	Elastic spring stiffness

Attribute: 3 Title: Joint 1

Sub Type = Joint Material, Spring Stiffness Only
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

	u	v	w	THx	THy	THz
K	1000000.0 1000000.0	1000000.0	1000000.0	1000000.0	1000000.0	

nDOF	JointType	Assignment
6	"3D beams and/or shells"	"Point"

Assignment to Points:
118T123

12. Support

U	Translation in X
V	Translation in Y
W	Translation in Z
THX	Rotation about X
THY	Rotation about Y
THZ	Rotation about Z
L1	Moment about hinge
pore	Pore pressure
HingeRotation	Hinge (Loft) rotation
poreStiff	Pore stiffness

Attribute: 1 Title: Support 1

Sub Type = Structural Support
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

U	V	W	THX	THY	THZ
"F"	"R"	"R"	"R"	"F"	"F"
L1	**pore**	**HingeRotation**	**poreStiff**		
"F"	"F"	0.0	0.0		

Assignment to Points:
135

Attribute: 4 Title: Support 3

Sub Type = Structural Support
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

U	V	W	THX	THY	THZ
"F"	"R"	"R"	"R"	"F"	"F"
L1	**pore**	**HingeRotation**	**poreStiff**		
"F"	"F"	0.0	0.0		

Assignment to Points:
136

springType	Spring stiffness distribution
THXstiff	Stiffness in rotation about X

Attribute: 2 Title: Support 2
Sub Type = Structural Support
Assigned in: Stage III; Stage II; Stage I; Drift-P; Drift-V

U	**V**	**W**	**THX**	**THY**	**THZ**
"R"	"R"	"R"	"S"	"R"	"F"
L1	**pore**	**springType**	**THXstiff**	**HingeRotation**	**poreStiff**
"F"	"F"	"Total"	2285e3	1425e3	0.0

Assignment to Points:
145

13. Body force load

AccX	Acceleration in X direction
AccY	Acceleration in Y direction
AccZ	Acceleration in Z direction
AngVelX	Angular velocity about X axis
AngVelY	Angular velocity about Y axis
AngVelZ	Angular velocity about Z axis
AngAccX	Angular acceleration about X axis
AngAccY	Angular acceleration about Y axis
AngAccZ	Angular acceleration about Z axis
lnFlAccX	Linear acceleration In X fluid phase
lnFlAccY	Linear acceleration In Y fluid phase
lnFlAccZ	Linear acceleration In Z fluid phase

Attribute: 2 Title: EGEN_1-1

Sub Type = Body Force Load
Assigned in: Stage I

AccX	AccY	AccZ	AngVelX	AngVelY	AngVelZ
0.0	0.0	-10.0	0.0	0.0	0.0
AngAccX	**AngAccY**	**AngAccZ**	**lnFlAccX**	**lnFlAccY**	**lnFlAccZ**
0.0	0.0	0.0	0.0	0.0	-10.0

Loadcase ID: 3 Title: EGEN_1-1 Factor = 1
Assignment to Lines:
125;126;131;133;138;142;143T145;147;150;152;171;172;173;180T184;189T193;198T202;205T211I3;357T364;494T501

Attribute: 7 Title: EGEN_1-2

Sub Type = Body Force Load
Assigned in: Stage I

AccX	AccY	AccZ	AngVelX	AngVelY	AngVelZ
0.0	0.0	-10.0	0.0	0.0	0.0
AngAccX	**AngAccY**	**AngAccZ**	**lnFlAccX**	**lnFlAccY**	**lnFlAccZ**
0.0	0.0	0.0	0.0	0.0	-10.0

Loadcase ID: 9 Title: EGEN_1-2 Factor = 1
Assignment to Lines:
163

14. Beam point load

type	Distance type
dirType	Load direction
d	Distance
Px	Point load in x direction
Py	Point load in y direction
Pz	Point load in z direction
Mx	Moment about x axis
My	Moment about y axis
Mz	Moment about z axis

Attribute: 8 Title: EGEN_1-4-1
Sub Type = Beam Point Load
Assigned in: Stage I

type	dirType	d	Px	Py	Pz
1	1	0.4	0.0	0.0	-94.0
Mx	**My**	**Mz**			
0.0	0.0	0.0			

Loadcase ID: 10 Title: EGEN_1-4 Factor = 1
Assignment to Lines:
125;143

Attribute: 9 Title: EGEN_1-4-2
Sub Type = Beam Point Load
Assigned in: Stage I

type	dirType	d	Px	Py	Pz
1	1	1.1	0.0	0.0	-94.0
Mx	**My**	**Mz**			
0.0	0.0	0.0			

Loadcase ID: 10 Title: EGEN_1-4 Factor = 1
Assignment to Lines:
126;144

Attribute: 10 Title: EGEN_1-5-1
Sub Type = Beam Point Load
Assigned in: Stage I

type	dirType	d	Px	Py	Pz
1	1	1.5	0.0	0.0	-48.0
Mx	**My**	**Mz**			
0.0	52.0	0.0			

Loadcase ID: 11 Title: EGEN_1-5 Factor = 1
Assignment to Lines:
125;143

Attribute: 11 Title: EGEN_1-5-2

Sub Type = Beam Point Load
Assigned in: Stage I

type	dirType	d	Px	Py	Pz
1	1	0.0	0.0	0.0	-47.0
Mx	**My**	**Mz**			
0.0	-50.0	0.0			

Loadcase ID: 11 Title: EGEN_1-5 Factor = 1
Assignment to Lines:
126;144

Attribute: 22 Title: KRYMP-1

Sub Type = Beam Point Load
Assigned in: Drift-P

type	dirType	d	Px	Py	Pz
1	3	0.0	1994.0	0.0	0.0
Mx	**My**	**Mz**			
0.0	470.0	0.0			

Loadcase ID: 37 Title: KRYMP-1 Factor = 1
Assignment to Lines:
125;143

Attribute: 23 Title: KRYMP-2

Sub Type = Beam Point Load
Assigned in: Drift-P

type	dirType	d	Px	Py	Pz
1	3	4.5	-1994.0	0.0	0.0
Mx	**My**	**Mz**			
0.0	-524.0	0.0			

Loadcase ID: 38 Title: KRYMP-2 Factor = 1
Assignment to Lines:
494;496

Attribute: 24 Title: KRYMP-3

Sub Type = Beam Point Load
Assigned in: Drift-P

type	dirType	d	Px	Py	Pz
1	3	0.0	1994.0	0.0	0.0
Mx	**My**	**Mz**			
0.0	524.0	0.0			

Loadcase ID: 39 Title: KRYMP-3 Factor = 1
Assignment to Lines:
499;501

Attribute: 25 Title: KRYMP-4

Sub Type = Beam Point Load
Assigned in: Drift-P

type	dirType	d	Px	Py	Pz
1	3	1.5	-1994.0	0.0	0.0

Mx	My	Mz
0.0	-470.0	0.0

Loadcase ID: 40 Title: KRYMP-4 Factor = 1
Assignment to Lines:
126;144

Attribute: 45 Title: OVER-1

Sub Type = Beam Point Load
Assigned in: Drift-V

type	dirType	d	Px	Py	Pz
1	1	0.0	11.0	0.0	0.0

Mx	My	Mz
0.0	-6.0	0.0

Loadcase ID: 2111 Title: OVER-1 Factor = 1
Assignment to Lines:
125;143

Attribute: 46 Title: OJTEMP-1

Sub Type = Beam Point Load
Assigned in: Drift-V

type	dirType	d	Px	Py	Pz
1	3	0.0	1652.0	0.0	0.0

Mx	My	Mz
0.0	238.0	0.0

Loadcase ID: 2112 Title: OJTEMP+ Factor = 1
Assignment to Lines:
125;143

Attribute: 47 Title: OVER-2

Sub Type = Beam Point Load
Assigned in: Drift-V

type	dirType	d	Px	Py	Pz
1	1	1.5	-11.0	0.0	0.0

Mx	My	Mz
0.0	6.0	0.0

Loadcase ID: 2110 Title: OVER-2 Factor = 1
Assignment to Lines:
126;144

Attribute: 48 Title: OJTEMP-2

Sub Type = Beam Point Load
Assigned in: Drift-V

type	dirType	d	Px	Py	Pz
1	3	4.5	-1652.0	0.0	0.0

Mx	My	Mz
0.0	-265.0	0.0

Loadcase ID: 2112 Title: OJTEMP+ Factor = 1
Assignment to Lines:
494T497

Attribute: 49 Title: OJTEMP-3

Sub Type = Beam Point Load
Assigned in: Drift-V

type	dirType	d	Px	Py	Pz
1	3	0.0	1652.0	0.0	0.0

Mx	My	Mz
0.0	265.0	0.0

Loadcase ID: 2112 Title: OJTEMP+ Factor = 1
Assignment to Lines:
498T501

Attribute: 50 Title: OJTEMP-4

Sub Type = Beam Point Load
Assigned in: Drift-V

type	dirType	d	Px	Py	Pz
1	3	1.5	-1562.0	0.0	0.0

Mx	My	Mz
0.0	-238.0	0.0

Loadcase ID: 2112 Title: OJTEMP+ Factor = 1
Assignment to Lines:
126;144

Attribute: 53 Title: JTEMP 1

Sub Type = Beam Point Load
Assigned in: Drift-V

type	dirType	d	Px	Py	Pz
1	0	0.0	328.0	0.0	0.0

Mx	My	Mz
0.0	-328.0	0.0

Loadcase ID: 2118 Title: JTEMP 1 Factor = 1
Assignment to Lines:
125;143

Attribute: 54 Title: JTEMP 2

Sub Type = Beam Point Load

Assigned in: Drift-V

type	dirType	d	Px	Py	Pz
1	0	1.5	-328.0	0.0	0.0

Mx	My	Mz
0.0	328.0	0.0

Loadcase ID: 2119 Title: JTEMP 2 Factor = 1

Assignment to Lines:

126;144

15. Global distributed load

MX	Moment about X axis
MY	Moment about Y axis
MZ	Moment about Z axis
Hinge	Moment about hinge

Attribute: 13 Title: FORM-
Sub Type = Global Distributed Load
Assigned in: Drift-P

type	WX	WY	WZ	MX	MY
"Length"	0.0	0.0	1.0	0.0	0.0

MZ	Hinge
0.0	0.0

Loadcase ID: 15 Title: FORM- Factor = 1
Assignment to Lines:
125;126;131;133;138;142;143T145;147;150;152;357;358T364;494T501

Attribute: 14 Title: JORD_1
Sub Type = Beam Point Load
Assigned in: Drift-P

type	dirType	d	Px	Py	Pz
1	1	0.0	59.0	0.0	0.0

Mx	My	Mz
0.0	-58.0	0.0

Loadcase ID: 2123 Title: JORD 1 Factor = 1
Assignment to Lines:
125;143

Attribute: 15 Title: JORD_2
Sub Type = Beam Point Load
Assigned in: Drift-P

type	dirType	d	Px	Py	Pz
1	1	1.5	-59.0	0.0	0.0

Mx	My	Mz
0.0	58.0	0.0

Loadcase ID: 2124 Title: JORD 2 Factor = 1
Assignment to Lines:
126;144

Attribute: 51 Title: VIND-
Sub Type = Global Distributed Load
Assigned in: Drift-V

type	WX	WY	WZ	MX	MY
"Length"	0.0	-3.5	0.0	3.2	0.0

MZ	Hinge
0.0	0.0

Loadcase ID: 2115 Title: VIND- Factor = 1
Assignment to Lines:
143T145;147;150;152;358;360T364I2;494;495;500;501

Attribute: 52 Title: VIND+
Sub Type = Global Distributed Load
Assigned in: Drift-V

type	WX	WY	WZ	MX	MY
"Length"	0.0	3.5	0.0	-3.2	0.0

MZ	Hinge
0.0	0.0

Loadcase ID: 2114 Title: VIND+ Factor = 1
Assignment to Lines:
125;126;131;133;138;142;357T363I2;496T499

Attribute: 3 Title: EGEN_1-3
Sub Type = Global Distributed Load
Assigned in: Stage I

type	WX	WY	WZ	MX	MY
"Length"	0.0	0.0	-16.2	0.0	0.0

MZ	Hinge
0.0	0.0

Loadcase ID: 4 Title: EGEN_1-3 Factor = 1
Assignment to Lines:
125;131;143;145;357;358
Assigned in: Stage I

Attribute: 4 Title: EGEN_3
Sub Type = Global Distributed Load
Assigned in: Stage III

type	WX	WY	WZ	MX	MY
"Length"	0.0	0.0	-16.2	0.0	0.0

MZ	Hinge
0.0	0.0

Loadcase ID: 7 Title: EGEN_3 Factor = 1
Assignment to Lines:
133;142;147;152;359;360;363;364;494T501

Attribute: 1 Title: EGEN_2
Sub Type = Global Distributed Load
Assigned in: Stage III

type	WX	WY	WZ	MX	MY
"Length"	0.0	0.0	-16.2	0.0	0.0

MZ	Hinge
0.0	0.0

Loadcase ID: 6 Title: EGEN_2 Factor = 1
Assignment to Lines:
126;138;144;150;361;362

Attribute: 5 Title: BELAGG
Sub Type = Global Distributed Load
Assigned in: Drift-P

type	WX	WY	WZ
"Area"	0.0	0.0	-2.1

Loadcase ID: 16 Title: BELAGG Factor = 1
Assignment to Surfaces:
1;4;6;8;9;10;21;23;26;28;29;30;41;43;46;48;49;50;54T56;60T62;66T68;72T74;78T89

16. Prescribed load

type	Attribute type
U	Prescribed displacement in X
V	Prescribed displacement in Y
W	Prescribed displacement in Z
THX	Prescribed rotation about X
THY	Prescribed rotation about Y
THZ	Prescribed rotation about Z
L1	Prescribed hinge rotation
pore	Pore pressure
haveDispX	Fixed displacement in X
haveDispY	Fixed displacement in Y
haveDispZ	Fixed displacement in Z
haveRotX	Fixed rotation about X
haveRotY	Fixed rotation about Y
haveRotZ	Fixed rotation about Z
haveRotLocal	Fixed hinge rotation
havePorePres	Fixed pore pressure

Attribute: 16 Title: STOD_1Z

Sub Type = Prescribed Load
Assigned in: Drift-P

type	**U**	**V**	**W**	**THX**	**THY**
"Total"	0.0	0.0	0.0	0.0	0.0
THZ	**L1**	**pore**	**haveDispX**	**haveDispY**	**haveDispZ**
0.0	0.0	0.0	false	false	true
haveRotX	**haveRotY**	**haveRotZ**	**haveRotLocal**	**havePorePres**	
false	false	false	false	false	

Loadcase ID: 22 Title: STOD_1Z Factor = 1
Assignment to Points:
135

Attribute: 17 Title: STOD_2Z

Sub Type = Prescribed Load
Assigned in: Drift-P

type	**U**	**V**	**W**	**THX**	**THY**
"Total"	0.0	0.0	0.0	0.0	0.0
THZ	**L1**	**pore**	**haveDispX**	**haveDispY**	**haveDispZ**
0.0	0.0	0.0	false	false	true
haveRotX	**haveRotY**	**haveRotZ**	**haveRotLocal**	**havePorePres**	
false	false	false	false	false	

Loadcase ID: 23 Title: STOD_2Z Factor = 1
Assignment to Points:
145

Attribute: 18 Title: STOD_3Z

Sub Type = Prescribed Load
Assigned in: Drift-P

type	U	V	W	THX	THY
"Total"	0.0	0.0	0.0	0.0	0.0
THZ	**L1**	**pore**	**haveDispX**	**haveDispY**	**haveDispZ**
0.0	0.0	0.0	false	false	true
haveRotX	**haveRotY**	**haveRotZ**	**haveRotLocal**	**havePorePres**	
false	false	false	false	false	

Loadcase ID: 24 Title: STOD_3Z Factor = 1
Assignment to Points:
136

Attribute: 19 Title: STOD_1Y

Sub Type = Prescribed Load
Assigned in: Drift-P

type	U	V	W	THX	THY
"Total"	0.0	0.0	0.0	0.0	0.0
THZ	**L1**	**pore**	**haveDispX**	**haveDispY**	**haveDispZ**
0.0	0.0	0.0	false	true	false
haveRotX	**haveRotY**	**haveRotZ**	**haveRotLocal**	**havePorePres**	
false	false	false	false	false	

Loadcase ID: 25 Title: STOD 1Y+ Factor = 1
Assignment to Points:
135

Attribute: 20 Title: STOD_2Y

Sub Type = Prescribed Load
Assigned in: Drift-P

type	U	V	W	THX	THY
"Total"	0.0	0.0	0.0	0.0	0.0
THZ	**L1**	**pore**	**haveDispX**	**haveDispY**	**haveDispZ**
0.0	0.0	0.0	false	true	false
haveRotX	**haveRotY**	**haveRotZ**	**haveRotLocal**	**havePorePres**	
false	false	false	false	false	

Loadcase ID: 26 Title: STOD 2Y+ Factor = 1
Assignment to Points:
145

Attribute: 21 Title: STOD_3Y
Sub Type = Prescribed Load
Assigned in: Drift-P

type	U	V	W	THX	THY
"Total"	0.0	0.0	0.0	0.0	0.0
THZ	**L1**	**pore**	**haveDispX**	**haveDispY**	**haveDispZ**
0.0	0.0	0.0	false	true	false
haveRotX	**haveRotY**	**haveRotZ**	**haveRotLocal**	**havePorePres**	
false	false	false	false	false	

Loadcase ID: 27 Title: STOD 3Y+ Factor = 1
Assignment to Points:
136

17. Concentrated load

PX	Load in X direction
PY	Load in Y direction
PZ	Load in Z direction
MX	Moment about X axis
MY	Moment about Y axis
MZ	Moment about Z axis
L1	Moment about hinge
pore	Pore pressure

Attribute: 55 Title: Px = +49 kN

Sub Type = Concentrated Load

Assigned in: Drift-V

PX	PY	PZ	MX	MY	MZ
49.0	0.0	0.0	0.0	38.0	0.0

L1	pore
0.0	0.0

Loadcase ID: 2198 Title: Px = +49 kN Factor = 1
Assignment to Points:
110;131

Attribute: 56 Title: Px = -49 kN

Sub Type = Concentrated Load

Assigned in: Drift-V

PX	PY	PZ	MX	MY	MZ
-49.0	0.0	0.0	0.0	-38.0	0.0

L1	pore
0.0	0.0

Loadcase ID: 2199 Title: Px = -49 kN Factor = 1
Assignment to Points:
110;131

18. Discrete point load

dirType	Load direction
pDir	Projection vector
nGridX	X Grid size
nGridY	Y Grid size
pos	Coordinates
P	Load

Attribute: 42 Title: Renhallning

Sub Type = Discrete Point Load
Assigned in: Drift-V

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
0.0	0.65	2.0	-40.0
0.0	-0.65	2.0	-40.0
3.0	0.65	2.0	-20.0
3.0	-0.65	2.0	-20.0

Loadcase ID: 1000 Title: LoadID=42 Line=485 Dir=Fwd Pos=1 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
365
Loadcase ID: 1001 Title: LoadID=42 Line=485 Dir=Fwd Pos=2 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
372
Loadcase ID: 1002 Title: LoadID=42 Line=485 Dir=Fwd Pos=3 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
373
Loadcase ID: 1003 Title: LoadID=42 Line=485 Dir=Fwd Pos=4 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
374
Loadcase ID: 1004 Title: LoadID=42 Line=485 Dir=Fwd Pos=5 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
375
Loadcase ID: 1005 Title: LoadID=42 Line=485 Dir=Fwd Pos=6 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
376
Loadcase ID: 1006 Title: LoadID=42 Line=485 Dir=Fwd Pos=7 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:

377
Loadcase ID: 1007   Title: LoadID=42 Line=485 Dir=Fwd Pos=8 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
378
Loadcase ID: 1008   Title: LoadID=42 Line=485 Dir=Fwd Pos=9 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
379

Loadcase ID: 1009   Title: LoadID=42 Line=485 Dir=Fwd Pos=10 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
380
Loadcase ID: 1010   Title: LoadID=42 Line=485 Dir=Fwd Pos=11 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
381
Loadcase ID: 1011   Title: LoadID=42 Line=485 Dir=Fwd Pos=12 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
382
Loadcase ID: 1012   Title: LoadID=42 Line=485 Dir=Fwd Pos=13 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
383
Loadcase ID: 1013   Title: LoadID=42 Line=485 Dir=Fwd Pos=14 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
384
Loadcase ID: 1014   Title: LoadID=42 Line=485 Dir=Fwd Pos=15 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
385
Loadcase ID: 1015   Title: LoadID=42 Line=485 Dir=Fwd Pos=16 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
386
Loadcase ID: 1016   Title: LoadID=42 Line=485 Dir=Fwd Pos=17 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
387
Loadcase ID: 1017   Title: LoadID=42 Line=485 Dir=Fwd Pos=18 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
388
Loadcase ID: 1018   Title: LoadID=42 Line=485 Dir=Fwd Pos=19 Factor = 1

Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
389
Loadcase ID: 1019   Title: LoadID=42 Line=485 Dir=Fwd Pos=20 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
390
Loadcase ID: 1020   Title: LoadID=42 Line=485 Dir=Fwd Pos=21 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
391
Loadcase ID: 1021   Title: LoadID=42 Line=485 Dir=Fwd Pos=22 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
392

Loadcase ID: 1022   Title: LoadID=42 Line=485 Dir=Fwd Pos=23 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
393
Loadcase ID: 1023   Title: LoadID=42 Line=485 Dir=Fwd Pos=24 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
394
Loadcase ID: 1024   Title: LoadID=42 Line=485 Dir=Fwd Pos=25 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
395
Loadcase ID: 1025   Title: LoadID=42 Line=485 Dir=Fwd Pos=26 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
396
Loadcase ID: 1026   Title: LoadID=42 Line=485 Dir=Fwd Pos=27 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
397
Loadcase ID: 1027   Title: LoadID=42 Line=485 Dir=Fwd Pos=28 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
398
Loadcase ID: 1028   Title: LoadID=42 Line=485 Dir=Fwd Pos=29 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
399
Loadcase ID: 1029   Title: LoadID=42 Line=485 Dir=Fwd Pos=30 Factor = 1

Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
400
Loadcase ID: 1030   Title: LoadID=42 Line=485 Dir=Fwd Pos=31 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
401
Loadcase ID: 1031   Title: LoadID=42 Line=485 Dir=Fwd Pos=32 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
402
Loadcase ID: 1032   Title: LoadID=42 Line=485 Dir=Fwd Pos=33 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
403
Loadcase ID: 1033   Title: LoadID=42 Line=485 Dir=Fwd Pos=34 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
404
Loadcase ID: 1034   Title: LoadID=42 Line=485 Dir=Fwd Pos=35 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
405

Loadcase ID: 1035   Title: LoadID=42 Line=485 Dir=Fwd Pos=36 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
406
Loadcase ID: 1036   Title: LoadID=42 Line=485 Dir=Fwd Pos=37 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
407
Loadcase ID: 1037   Title: LoadID=42 Line=485 Dir=Fwd Pos=38 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
408
Loadcase ID: 1038   Title: LoadID=42 Line=485 Dir=Fwd Pos=39 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
409
Loadcase ID: 1039   Title: LoadID=42 Line=485 Dir=Fwd Pos=40 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
410
Loadcase ID: 1040   Title: LoadID=42 Line=485 Dir=Fwd Pos=41 Factor = 1

Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
411
Loadcase ID: 1041   Title: LoadID=42 Line=485 Dir=Fwd Pos=42 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
412
Loadcase ID: 1042   Title: LoadID=42 Line=485 Dir=Fwd Pos=43 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
413
Loadcase ID: 1043   Title: LoadID=42 Line=485 Dir=Fwd Pos=44 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
414
Loadcase ID: 1044   Title: LoadID=42 Line=485 Dir=Fwd Pos=45 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
415
Loadcase ID: 1045   Title: LoadID=42 Line=485 Dir=Fwd Pos=46 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
416
Loadcase ID: 1046   Title: LoadID=42 Line=485 Dir=Fwd Pos=47 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
417
Loadcase ID: 1047   Title: LoadID=42 Line=485 Dir=Fwd Pos=48 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
418

Loadcase ID: 1048   Title: LoadID=42 Line=485 Dir=Fwd Pos=49 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
419
Loadcase ID: 1049   Title: LoadID=42 Line=485 Dir=Fwd Pos=50 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
420
Loadcase ID: 1050   Title: LoadID=42 Line=485 Dir=Fwd Pos=51 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
421
Loadcase ID: 1051   Title: LoadID=42 Line=485 Dir=Fwd Pos=52 Factor = 1

Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
422
Loadcase ID: 1052   Title: LoadID=42 Line=485 Dir=Fwd Pos=53 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
423
Loadcase ID: 1053   Title: LoadID=42 Line=485 Dir=Fwd Pos=54 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
424
Loadcase ID: 1054   Title: LoadID=42 Line=485 Dir=Fwd Pos=55 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
425
Loadcase ID: 1055   Title: LoadID=42 Line=485 Dir=Fwd Pos=56 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
426
Loadcase ID: 1056   Title: LoadID=42 Line=485 Dir=Fwd Pos=57 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
427
Loadcase ID: 1057   Title: LoadID=42 Line=485 Dir=Fwd Pos=58 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
428
Loadcase ID: 1058   Title: LoadID=42 Line=485 Dir=Fwd Pos=59 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
429
Loadcase ID: 1059   Title: LoadID=42 Line=485 Dir=Fwd Pos=60 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
430
Loadcase ID: 1060   Title: LoadID=42 Line=485 Dir=Fwd Pos=61 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
431

Loadcase ID: 1061   Title: LoadID=42 Line=485 Dir=Fwd Pos=62 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
432
Loadcase ID: 1062   Title: LoadID=42 Line=485 Dir=Fwd Pos=63 Factor = 1

Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
433
Loadcase ID: 1063 Title: LoadID=42 Line=485 Dir=Fwd Pos=64 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
434
Loadcase ID: 1064 Title: LoadID=42 Line=485 Dir=Fwd Pos=65 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
435
Loadcase ID: 1065 Title: LoadID=42 Line=485 Dir=Fwd Pos=66 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
436
Loadcase ID: 1066 Title: LoadID=42 Line=485 Dir=Fwd Pos=67 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
437
Loadcase ID: 1067 Title: LoadID=42 Line=485 Dir=Fwd Pos=68 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
438
Loadcase ID: 1068 Title: LoadID=42 Line=485 Dir=Fwd Pos=69 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
439
Loadcase ID: 1069 Title: LoadID=42 Line=485 Dir=Fwd Pos=70 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
440
Loadcase ID: 1070 Title: LoadID=42 Line=485 Dir=Fwd Pos=71 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
441
Loadcase ID: 1071 Title: LoadID=42 Line=485 Dir=Fwd Pos=72 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
442
Loadcase ID: 1072 Title: LoadID=42 Line=485 Dir=Fwd Pos=73 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
443
Loadcase ID: 1073 Title: LoadID=42 Line=485 Dir=Fwd Pos=74 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:

444

Loadcase ID: 1074   Title: LoadID=42 Line=485 Dir=Fwd Pos=75 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
445
Loadcase ID: 1075   Title: LoadID=42 Line=485 Dir=Fwd Pos=76 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
446
Loadcase ID: 1076   Title: LoadID=42 Line=485 Dir=Fwd Pos=77 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
447
Loadcase ID: 1077   Title: LoadID=42 Line=485 Dir=Fwd Pos=78 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
448
Loadcase ID: 1078   Title: LoadID=42 Line=485 Dir=Fwd Pos=79 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
449
Loadcase ID: 1079   Title: LoadID=42 Line=485 Dir=Fwd Pos=80 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
450
Loadcase ID: 1080   Title: LoadID=42 Line=485 Dir=Fwd Pos=81 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
451
Loadcase ID: 1081   Title: LoadID=42 Line=485 Dir=Fwd Pos=82 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
452
Loadcase ID: 1082   Title: LoadID=42 Line=485 Dir=Fwd Pos=83 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
453
Loadcase ID: 1083   Title: LoadID=42 Line=485 Dir=Fwd Pos=84 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
454
Loadcase ID: 1084   Title: LoadID=42 Line=485 Dir=Fwd Pos=85 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:

455
Loadcase ID: 1085   Title: LoadID=42 Line=485 Dir=Fwd Pos=86 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
456
Loadcase ID: 1086   Title: LoadID=42 Line=485 Dir=Fwd Pos=87 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
457

Loadcase ID: 1087   Title: LoadID=42 Line=485 Dir=Fwd Pos=88 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
458
Loadcase ID: 1088   Title: LoadID=42 Line=485 Dir=Fwd Pos=89 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
459
Loadcase ID: 1089   Title: LoadID=42 Line=485 Dir=Fwd Pos=90 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
460
Loadcase ID: 1090   Title: LoadID=42 Line=485 Dir=Fwd Pos=91 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
461
Loadcase ID: 1091   Title: LoadID=42 Line=485 Dir=Fwd Pos=92 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
462
Loadcase ID: 1092   Title: LoadID=42 Line=485 Dir=Fwd Pos=93 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
463
Loadcase ID: 1093   Title: LoadID=42 Line=485 Dir=Fwd Pos=94 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
464
Loadcase ID: 1094   Title: LoadID=42 Line=485 Dir=Fwd Pos=95 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
465
Loadcase ID: 1095   Title: LoadID=42 Line=485 Dir=Fwd Pos=96 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:

466
Loadcase ID: 1096   Title: LoadID=42 Line=485 Dir=Fwd Pos=97 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
467
Loadcase ID: 1097   Title: LoadID=42 Line=485 Dir=Fwd Pos=98 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
468
Loadcase ID: 1098   Title: LoadID=42 Line=485 Dir=Fwd Pos=99 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
469
Loadcase ID: 1099   Title: LoadID=42 Line=485 Dir=Fwd Pos=100 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
470

Loadcase ID: 1100   Title: LoadID=42 Line=485 Dir=Fwd Pos=101 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
471
Loadcase ID: 1101   Title: LoadID=42 Line=485 Dir=Fwd Pos=102 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
472
Loadcase ID: 1102   Title: LoadID=42 Line=485 Dir=Fwd Pos=103 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
473
Loadcase ID: 1103   Title: LoadID=42 Line=485 Dir=Fwd Pos=104 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
474
Loadcase ID: 1104   Title: LoadID=42 Line=485 Dir=Fwd Pos=105 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
475
Loadcase ID: 1105   Title: LoadID=42 Line=485 Dir=Fwd Pos=106 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
369
Loadcase ID: 2000   Title: LoadID=42 Line=486 Dir=Fwd Pos=1 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:

370
Loadcase ID: 2001 Title: LoadID=42 Line=486 Dir=Fwd Pos=2 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
476
Loadcase ID: 2002 Title: LoadID=42 Line=486 Dir=Fwd Pos=3 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
477
Loadcase ID: 2003 Title: LoadID=42 Line=486 Dir=Fwd Pos=4 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
478
Loadcase ID: 2004 Title: LoadID=42 Line=486 Dir=Fwd Pos=5 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
479
Loadcase ID: 2005 Title: LoadID=42 Line=486 Dir=Fwd Pos=6 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
480
Loadcase ID: 2006 Title: LoadID=42 Line=486 Dir=Fwd Pos=7 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
481

Loadcase ID: 2007 Title: LoadID=42 Line=486 Dir=Fwd Pos=8 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
482
Loadcase ID: 2008 Title: LoadID=42 Line=486 Dir=Fwd Pos=9 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
483
Loadcase ID: 2009 Title: LoadID=42 Line=486 Dir=Fwd Pos=10 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
484
Loadcase ID: 2010 Title: LoadID=42 Line=486 Dir=Fwd Pos=11 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
485
Loadcase ID: 2011 Title: LoadID=42 Line=486 Dir=Fwd Pos=12 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:

486
Loadcase ID: 2012 Title: LoadID=42 Line=486 Dir=Fwd Pos=13 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
487
Loadcase ID: 2013 Title: LoadID=42 Line=486 Dir=Fwd Pos=14 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
488
Loadcase ID: 2014 Title: LoadID=42 Line=486 Dir=Fwd Pos=15 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
489
Loadcase ID: 2015 Title: LoadID=42 Line=486 Dir=Fwd Pos=16 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
490
Loadcase ID: 2016 Title: LoadID=42 Line=486 Dir=Fwd Pos=17 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
491
Loadcase ID: 2017 Title: LoadID=42 Line=486 Dir=Fwd Pos=18 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
492
Loadcase ID: 2018 Title: LoadID=42 Line=486 Dir=Fwd Pos=19 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
493
Loadcase ID: 2019 Title: LoadID=42 Line=486 Dir=Fwd Pos=20 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
494

Loadcase ID: 2020 Title: LoadID=42 Line=486 Dir=Fwd Pos=21 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
495
Loadcase ID: 2021 Title: LoadID=42 Line=486 Dir=Fwd Pos=22 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
496
Loadcase ID: 2022 Title: LoadID=42 Line=486 Dir=Fwd Pos=23 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:

497
Loadcase ID: 2023   Title: LoadID=42 Line=486 Dir=Fwd Pos=24 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
498
Loadcase ID: 2024   Title: LoadID=42 Line=486 Dir=Fwd Pos=25 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
499
Loadcase ID: 2025   Title: LoadID=42 Line=486 Dir=Fwd Pos=26 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
500
Loadcase ID: 2026   Title: LoadID=42 Line=486 Dir=Fwd Pos=27 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
501
Loadcase ID: 2027   Title: LoadID=42 Line=486 Dir=Fwd Pos=28 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
502
Loadcase ID: 2028   Title: LoadID=42 Line=486 Dir=Fwd Pos=29 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
503
Loadcase ID: 2029   Title: LoadID=42 Line=486 Dir=Fwd Pos=30 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
504
Loadcase ID: 2030   Title: LoadID=42 Line=486 Dir=Fwd Pos=31 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
505
Loadcase ID: 2031   Title: LoadID=42 Line=486 Dir=Fwd Pos=32 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
506
Loadcase ID: 2032   Title: LoadID=42 Line=486 Dir=Fwd Pos=33 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
507

Loadcase ID: 2033   Title: LoadID=42 Line=486 Dir=Fwd Pos=34 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:

508
Loadcase ID: 2034 Title: LoadID=42 Line=486 Dir=Fwd Pos=35 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
509
Loadcase ID: 2035 Title: LoadID=42 Line=486 Dir=Fwd Pos=36 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
510
Loadcase ID: 2036 Title: LoadID=42 Line=486 Dir=Fwd Pos=37 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
511
Loadcase ID: 2037 Title: LoadID=42 Line=486 Dir=Fwd Pos=38 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
512
Loadcase ID: 2038 Title: LoadID=42 Line=486 Dir=Fwd Pos=39 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
513
Loadcase ID: 2039 Title: LoadID=42 Line=486 Dir=Fwd Pos=40 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
514
Loadcase ID: 2040 Title: LoadID=42 Line=486 Dir=Fwd Pos=41 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
515
Loadcase ID: 2041 Title: LoadID=42 Line=486 Dir=Fwd Pos=42 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
516
Loadcase ID: 2042 Title: LoadID=42 Line=486 Dir=Fwd Pos=43 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
517
Loadcase ID: 2043 Title: LoadID=42 Line=486 Dir=Fwd Pos=44 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
518
Loadcase ID: 2044 Title: LoadID=42 Line=486 Dir=Fwd Pos=45 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
519
Loadcase ID: 2045 Title: LoadID=42 Line=486 Dir=Fwd Pos=46 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK

Moving status = Exclude All Load   Assign type = area
Assignment to Points:
520

Loadcase ID: 2046   Title: LoadID=42 Line=486 Dir=Fwd Pos=47 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
521
Loadcase ID: 2047   Title: LoadID=42 Line=486 Dir=Fwd Pos=48 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
522
Loadcase ID: 2048   Title: LoadID=42 Line=486 Dir=Fwd Pos=49 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
523
Loadcase ID: 2049   Title: LoadID=42 Line=486 Dir=Fwd Pos=50 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
524
Loadcase ID: 2050   Title: LoadID=42 Line=486 Dir=Fwd Pos=51 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
525
Loadcase ID: 2051   Title: LoadID=42 Line=486 Dir=Fwd Pos=52 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
526
Loadcase ID: 2052   Title: LoadID=42 Line=486 Dir=Fwd Pos=53 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
527
Loadcase ID: 2053   Title: LoadID=42 Line=486 Dir=Fwd Pos=54 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
528
Loadcase ID: 2054   Title: LoadID=42 Line=486 Dir=Fwd Pos=55 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
529
Loadcase ID: 2055   Title: LoadID=42 Line=486 Dir=Fwd Pos=56 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
530
Loadcase ID: 2056   Title: LoadID=42 Line=486 Dir=Fwd Pos=57 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK

Moving status = Exclude All Load   Assign type = area
Assignment to Points:
531
Loadcase ID: 2057   Title: LoadID=42 Line=486 Dir=Fwd Pos=58 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
532
Loadcase ID: 2058   Title: LoadID=42 Line=486 Dir=Fwd Pos=59 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
533

Loadcase ID: 2059   Title: LoadID=42 Line=486 Dir=Fwd Pos=60 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
534
Loadcase ID: 2060   Title: LoadID=42 Line=486 Dir=Fwd Pos=61 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
535
Loadcase ID: 2061   Title: LoadID=42 Line=486 Dir=Fwd Pos=62 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
536
Loadcase ID: 2062   Title: LoadID=42 Line=486 Dir=Fwd Pos=63 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
537
Loadcase ID: 2063   Title: LoadID=42 Line=486 Dir=Fwd Pos=64 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
538
Loadcase ID: 2064   Title: LoadID=42 Line=486 Dir=Fwd Pos=65 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
539
Loadcase ID: 2065   Title: LoadID=42 Line=486 Dir=Fwd Pos=66 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
540
Loadcase ID: 2066   Title: LoadID=42 Line=486 Dir=Fwd Pos=67 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
541
Loadcase ID: 2067   Title: LoadID=42 Line=486 Dir=Fwd Pos=68 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK

Moving status = Exclude All Load   Assign type = area
Assignment to Points:
542
Loadcase ID: 2068   Title: LoadID=42 Line=486 Dir=Fwd Pos=69 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
543
Loadcase ID: 2069   Title: LoadID=42 Line=486 Dir=Fwd Pos=70 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
544
Loadcase ID: 2070   Title: LoadID=42 Line=486 Dir=Fwd Pos=71 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
545
Loadcase ID: 2071   Title: LoadID=42 Line=486 Dir=Fwd Pos=72 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
546

Loadcase ID: 2072   Title: LoadID=42 Line=486 Dir=Fwd Pos=73 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
547
Loadcase ID: 2073   Title: LoadID=42 Line=486 Dir=Fwd Pos=74 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
548
Loadcase ID: 2074   Title: LoadID=42 Line=486 Dir=Fwd Pos=75 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
549
Loadcase ID: 2075   Title: LoadID=42 Line=486 Dir=Fwd Pos=76 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
550
Loadcase ID: 2076   Title: LoadID=42 Line=486 Dir=Fwd Pos=77 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
551
Loadcase ID: 2077   Title: LoadID=42 Line=486 Dir=Fwd Pos=78 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
552
Loadcase ID: 2078   Title: LoadID=42 Line=486 Dir=Fwd Pos=79 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK

Moving status = Exclude All Load Assign type = area
Assignment to Points:
553
Loadcase ID: 2079 Title: LoadID=42 Line=486 Dir=Fwd Pos=80 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
554
Loadcase ID: 2080 Title: LoadID=42 Line=486 Dir=Fwd Pos=81 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
555
Loadcase ID: 2081 Title: LoadID=42 Line=486 Dir=Fwd Pos=82 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
556
Loadcase ID: 2082 Title: LoadID=42 Line=486 Dir=Fwd Pos=83 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
557
Loadcase ID: 2083 Title: LoadID=42 Line=486 Dir=Fwd Pos=84 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
558
Loadcase ID: 2084 Title: LoadID=42 Line=486 Dir=Fwd Pos=85 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
559

Loadcase ID: 2085 Title: LoadID=42 Line=486 Dir=Fwd Pos=86 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
560
Loadcase ID: 2086 Title: LoadID=42 Line=486 Dir=Fwd Pos=87 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
561
Loadcase ID: 2087 Title: LoadID=42 Line=486 Dir=Fwd Pos=88 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
562
Loadcase ID: 2088 Title: LoadID=42 Line=486 Dir=Fwd Pos=89 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
563
Loadcase ID: 2089 Title: LoadID=42 Line=486 Dir=Fwd Pos=90 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK

Moving status = Exclude All Load   Assign type = area
Assignment to Points:
564
Loadcase ID: 2090   Title: LoadID=42 Line=486 Dir=Fwd Pos=91 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
565
Loadcase ID: 2091   Title: LoadID=42 Line=486 Dir=Fwd Pos=92 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
566
Loadcase ID: 2092   Title: LoadID=42 Line=486 Dir=Fwd Pos=93 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
567
Loadcase ID: 2093   Title: LoadID=42 Line=486 Dir=Fwd Pos=94 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
568
Loadcase ID: 2094   Title: LoadID=42 Line=486 Dir=Fwd Pos=95 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
569
Loadcase ID: 2095   Title: LoadID=42 Line=486 Dir=Fwd Pos=96 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
570
Loadcase ID: 2096   Title: LoadID=42 Line=486 Dir=Fwd Pos=97 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
571
Loadcase ID: 2097   Title: LoadID=42 Line=486 Dir=Fwd Pos=98 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
572

Loadcase ID: 2098   Title: LoadID=42 Line=486 Dir=Fwd Pos=99 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
573
Loadcase ID: 2099   Title: LoadID=42 Line=486 Dir=Fwd Pos=100 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
574
Loadcase ID: 2100   Title: LoadID=42 Line=486 Dir=Fwd Pos=101 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK

Moving status = Exclude All Load   Assign type = area
Assignment to Points:
575
Loadcase ID: 2101   Title: LoadID=42 Line=486 Dir=Fwd Pos=102 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
576
Loadcase ID: 2102   Title: LoadID=42 Line=486 Dir=Fwd Pos=103 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
577
Loadcase ID: 2103   Title: LoadID=42 Line=486 Dir=Fwd Pos=104 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
578
Loadcase ID: 2104   Title: LoadID=42 Line=486 Dir=Fwd Pos=105 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:
579
Loadcase ID: 2105   Title: LoadID=42 Line=486 Dir=Fwd Pos=106 Factor = 1
Patch transformation = None   Load transformation = None
Search area=DECK
Moving status = Exclude All Load   Assign type = area
Assignment to Points:

19. 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: 26 Title: Ytlast 1-1

Sub Type = Discrete Patch Load
Assigned in: Drift-V
Patch type: 4-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
0.0	1.0	2.0	-5.0
1.5	1.0	2.0	-5.0
1.5	2.0	2.0	-5.0
0.0	2.0	2.0	-5.0

Loadcase ID: 41 Title: Ytlast 1-1 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 27 Title: Ytlast 1-2

Sub Type = Discrete Patch Load
Assigned in: Drift-V
Patch type: 4-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
1.5	1.0	2.0	-5.0
24.5	1.0	2.0	-5.0
24.5	2.0	2.0	-5.0
1.5	2.0	2.0	-5.0

Loadcase ID: 42 Title: Ytlast 1-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 28 Title: Ytlast 1-3

Sub Type = Discrete Patch Load

Assigned in: Drift-V

Patch type: 4-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
24.5	1.0	2.0	-5.0
47.5	1.0	2.0	-5.0
47.5	2.0	2.0	-5.0
24.5	2.0	2.0	-5.0

Loadcase ID: 43 Title: Ytlast 1-3 Factor = 1

Patch transformation = None Load transformation = None

Search area=DECK

Moving status = Exclude All Load Assign type = area

Assignment to Points:

260

Attribute: 29 Title: Ytlast 1-4

Sub Type = Discrete Patch Load

Assigned in: Drift-V

Patch type: Assigned in: Drift-V

4-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
47.5	1.0	2.0	-5.0
49.0	1.0	2.0	-5.0
49.0	2.0	2.0	-5.0
47.5	2.0	2.0	-5.0

Loadcase ID: 44 Title: Ytlast 1-4 Factor = 1

Patch transformation = None Load transformation = None

Search area=DECK

Moving status = Exclude All Load Assign type = area

Assignment to Points:

260

Attribute: 30 Title: Ytlast 2-1

Sub Type = Discrete Patch Load

Assigned in: Drift-V

Patch type: 4-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
1.5	1.0	2.0	-5.0
0.0	1.0	2.0	-5.0
0.0	0.0	2.0	-5.0
1.5	0.0	2.0	-5.0

Loadcase ID: 45 Title: Ytlast 2-1 Factor = 1

Patch transformation = None Load transformation = None

Search area=DECK

Moving status = Exclude All Load Assign type = area

Assignment to Points:

260

Attribute: 31 Title: Ytlast 2-2
Sub Type = Discrete Patch Load
Assigned in: Drift-V
Patch type: 4-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**
1.5	1.0	2.0	-5.0
1.5	0.0	2.0	-5.0
24.5	0.0	2.0	-5.0
24.5	1.0	2.0	-5.0

Loadcase ID: 46 Title: Ytlast 2-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 32 Title: Ytlast 2-3
Sub Type = Discrete Patch Load
Assigned in: Drift-V
Patch type: 4-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**
47.5	1.0	2.0	-5.0
47.5	0.0	2.0	-5.0
24.5	0.0	2.0	-5.0
24.5	1.0	2.0	-5.0

Loadcase ID: 47 Title: Ytlast 2_3 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 33 Title: Ytlast 2-4
Sub Type = Discrete Patch Load
Assigned in: Drift-V

Patch type: 4-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**
47.5	1.0	2.0	-5.0
49.0	1.0	2.0	-5.0
49.0	0.0	2.0	-5.0
47.5	0.0	2.0	-5.0

Loadcase ID: 48 Title: Ytlast 2-4 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 34 Title: Ytlast 3-1

Sub Type = Discrete Patch Load
Assigned in: Drift-V
Patch type: 4-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
1.5	-1.0	2.0	-5.0
0.0	-1.0	2.0	-5.0
0.0	0.0	2.0	-5.0
1.5	0.0	2.0	-5.0

Loadcase ID: 49 Title: Ytlast 3-1 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 35 Title: Ytlast 3-2

Sub Type = Discrete Patch Load
Assigned in: Drift-V

Patch type: 4-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
1.5	-1.0	2.0	-5.0
1.5	0.0	2.0	-5.0
24.5	0.0	2.0	-5.0
24.5	-1.0	2.0	-5.0

Loadcase ID: 50 Title: Ytlast 3-2 Factor = 1
Patch transformation = None Load transformation = None Search area = None
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 36 Title: Ytlast 3-3

Sub Type = Discrete Patch Load
Assigned in: Drift-V
Patch type: 4-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
47.5	-1.0	2.0	-5.0
47.5	0.0	2.0	-5.0
24.5	0.0	2.0	-5.0
24.5	-1.0	2.0	-5.0

Loadcase ID: 51 Title: Ytlast 3-3 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 37 Title: Ytlast 3-4

Sub Type = Discrete Patch Load
Assigned in: Drift-V

Patch type: 4-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**
47.5	-1.0	2.0	-5.0
49.0	-1.0	2.0	-5.0
49.0	0.0	2.0	-5.0
47.5	0.0	2.0	-5.0

Loadcase ID: 52 Title: Ytlast 3-4 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 38 Title: Ytlast 4-1

Sub Type = Discrete Patch Load
Assigned in: Drift-V
Patch type: 4-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**
1.5	-1.0	2.0	-5.0
0.0	-1.0	2.0	-5.0
0.0	-2.0	2.0	-5.0
1.5	-2.0	2.0	-5.0

Loadcase ID: 53 Title: Ytlast 4-1 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 39 Title: Ytlast 4-2

Sub Type = Discrete Patch Load
Assigned in: Drift-V

Patch type: 4-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
1.5	-1.0	2.0	-5.0
1.5	-2.0	2.0	-5.0
24.5	-2.0	2.0	-5.0
24.5	-1.0	2.0	-5.0

Loadcase ID: 54 Title: Ytlast 4-2 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 40 Title: Ytlast 4-3

Sub Type = Discrete Patch Load
Assigned in: Drift-V
Patch type: 4-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
47.5	-1.0	2.0	-5.0
47.5	-2.0	2.0	-5.0
24.5	-2.0	2.0	-5.0
24.5	-1.0	2.0	-5.0

Loadcase ID: 55 Title: Ytlast 4-3 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

Attribute: 41 Title: Ytlast 4-4

Sub Type = Discrete Patch Load
Assigned in: Drift-V
Patch type: 4-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
47.5	-1.0	2.0	-5.0
49.0	-1.0	2.0	-5.0
49.0	-2.0	2.0	-5.0
47.5	-2.0	2.0	-5.0

Loadcase ID: 56 Title: Ytlast 4-4 Factor = 1
Patch transformation = None Load transformation = None
Search area=DECK
Moving status = Exclude All Load Assign type = area
Assignment to Points:
260

20. Tied mesh constraint

doRigid Rigid

Attribute: 1 Title: Main girder A
Sub Type = Normal Tied Mesh Constraint
Assigned in: Stage I, Stage II, Stage III, Drift-P, Drift-V

doRigid

true

Assignment to Lines:
143T145;147;150;152;213;223;226;230;231;233;317;328T350I11;358T364I2;373;382;494;495;500;501;504;515;531;540;548;557

Attribute: 2 Title: Main girder B
Sub Type = Normal Tied Mesh Constraint
Assigned in: Stage I, Stage II, Stage III, Drift-P, Drift-V

doRigid

true

Assignment to Lines:
125;126;131;133;138;142;212;218;221;228;229;232;316T349I11;357T363I2;369;381;453;459;496T499;507;512;528;537;545;554

21. Deactivate

percent	Percentage of internal forces to be redistributed
createConstr	Process constraint equations
constrEquType	Constraint equation type

Attribute: 2 Title: Deactivate
Sub Type = Deactivate

percent	**createConstr**	**constrEquType**
100.0	false	"none"

21.1 Stage I

Assigned in: Stage I
Assignment to Surfaces:
4T8I2;9;26;28T30;46;48;49;50;60T62;66T68;72T74;78T89

21.2 Stage II

Assigned in: Stage II
Assignment to Surfaces:
4;6;28;29;48;49;60T62;72T74;78T89

21.3 Stage III

All active.

20.4 Drift-P

All active.

20.5 Drift-V

All active.

22. Search Area

Attribute: 1 Title: DECK
Sub Type = Search Area

Assignment to Surfaces:
1;4;6;8;9;10;21;23;26;28;29;30;41;43;46;48;49;50;54T56;60T62;66T68;72T74;78T89

23. Loadcases

Loadcase	Gravity	Title	Analysis	Type
15		FORM-	Drift-P	
16		BELAGG	Drift-P	
22		STOD_1Z	Drift-P	
23		STOD_2Z	Drift-P	
24		STOD_3Z	Drift-P	
25		STOD 1Y+	Drift-P	
26		STOD 2Y+	Drift-P	
27		STOD 3Y+	Drift-P	
37		KRYMP-1	Drift-P	
38		KRYMP-2	Drift-P	
39		KRYMP-3	Drift-P	
40		KRYMP-4	Drift-P	
2123		JORD 1	Drift-P	
2124		JORD 2	Drift-P	
41		Ytlast 1-1	Drift-V	
42		Ytlast 1-2	Drift-V	
43		Ytlast 1-3	Drift-V	
44		Ytlast 1-4	Drift-V	
45		Ytlast 2-1	Drift-V	
46		Ytlast 2-2	Drift-V	
47		Ytlast 2_3	Drift-V	
48		Ytlast 2-4	Drift-V	
49		Ytlast 3-1	Drift-V	
50		Ytlast 3-2	Drift-V	
51		Ytlast 3-3	Drift-V	
52		Ytlast 3-4	Drift-V	
53		Ytlast 4-1	Drift-V	
54		Ytlast 4-2	Drift-V	
55		Ytlast 4-3	Drift-V	
56		Ytlast 4-4	Drift-V	
1000		LoadID=42 Line=485 Dir=Fwd Pos=1	Drift-V	
1001		LoadID=42 Line=485 Dir=Fwd Pos=2	Drift-V	

1002	LoadID=42 Line=485 Dir=Fwd Pos=3	Drift-V
1003	LoadID=42 Line=485 Dir=Fwd Pos=4	Drift-V
1004	LoadID=42 Line=485 Dir=Fwd Pos=5	Drift-V
1005	LoadID=42 Line=485 Dir=Fwd Pos=6	Drift-V
1006	LoadID=42 Line=485 Dir=Fwd Pos=7	Drift-V
1007	LoadID=42 Line=485 Dir=Fwd Pos=8	Drift-V
1008	LoadID=42 Line=485 Dir=Fwd Pos=9	Drift-V
1009	LoadID=42 Line=485 Dir=Fwd Pos=10	Drift-V
1010	LoadID=42 Line=485 Dir=Fwd Pos=11	Drift-V
1011	LoadID=42 Line=485 Dir=Fwd Pos=12	Drift-V
1012	LoadID=42 Line=485 Dir=Fwd Pos=13	Drift-V
1013	LoadID=42 Line=485 Dir=Fwd Pos=14	Drift-V
1014	LoadID=42 Line=485 Dir=Fwd Pos=15	Drift-V
1015	LoadID=42 Line=485 Dir=Fwd Pos=16	Drift-V
1016	LoadID=42 Line=485 Dir=Fwd Pos=17	Drift-V
1017	LoadID=42 Line=485 Dir=Fwd Pos=18	Drift-V
1018	LoadID=42 Line=485 Dir=Fwd Pos=19	Drift-V
1019	LoadID=42 Line=485 Dir=Fwd Pos=20	Drift-V
1020	LoadID=42 Line=485 Dir=Fwd Pos=21	Drift-V
1021	LoadID=42 Line=485 Dir=Fwd Pos=22	Drift-V
1022	LoadID=42 Line=485 Dir=Fwd Pos=23	Drift-V
1023	LoadID=42 Line=485 Dir=Fwd Pos=24	Drift-V
1024	LoadID=42 Line=485 Dir=Fwd Pos=25	Drift-V
1025	LoadID=42 Line=485 Dir=Fwd Pos=26	Drift-V
1026	LoadID=42 Line=485 Dir=Fwd Pos=27	Drift-V
1027	LoadID=42 Line=485 Dir=Fwd Pos=28	Drift-V
1028	LoadID=42 Line=485 Dir=Fwd Pos=29	Drift-V
1029	LoadID=42 Line=485 Dir=Fwd Pos=30	Drift-V
1030	LoadID=42 Line=485 Dir=Fwd Pos=31	Drift-V
1031	LoadID=42 Line=485 Dir=Fwd Pos=32	Drift-V
1032	LoadID=42 Line=485 Dir=Fwd Pos=33	Drift-V
1033	LoadID=42 Line=485 Dir=Fwd Pos=34	Drift-V
1034	LoadID=42 Line=485 Dir=Fwd Pos=35	Drift-V
1035	LoadID=42 Line=485 Dir=Fwd Pos=36	Drift-V

1036	LoadID=42 Line=485 Dir=Fwd Pos=37	Drift-V
1037	LoadID=42 Line=485 Dir=Fwd Pos=38	Drift-V
1038	LoadID=42 Line=485 Dir=Fwd Pos=39	Drift-V
1039	LoadID=42 Line=485 Dir=Fwd Pos=40	Drift-V
1040	LoadID=42 Line=485 Dir=Fwd Pos=41	Drift-V
1041	LoadID=42 Line=485 Dir=Fwd Pos=42	Drift-V
1042	LoadID=42 Line=485 Dir=Fwd Pos=43	Drift-V
1043	LoadID=42 Line=485 Dir=Fwd Pos=44	Drift-V
1044	LoadID=42 Line=485 Dir=Fwd Pos=45	Drift-V
1045	LoadID=42 Line=485 Dir=Fwd Pos=46	Drift-V
1046	LoadID=42 Line=485 Dir=Fwd Pos=47	Drift-V
1047	LoadID=42 Line=485 Dir=Fwd Pos=48	Drift-V
1048	LoadID=42 Line=485 Dir=Fwd Pos=49	Drift-V
1049	LoadID=42 Line=485 Dir=Fwd Pos=50	Drift-V
1050	LoadID=42 Line=485 Dir=Fwd Pos=51	Drift-V
1051	LoadID=42 Line=485 Dir=Fwd Pos=52	Drift-V
1052	LoadID=42 Line=485 Dir=Fwd Pos=53	Drift-V
1053	LoadID=42 Line=485 Dir=Fwd Pos=54	Drift-V
1054	LoadID=42 Line=485 Dir=Fwd Pos=55	Drift-V
1055	LoadID=42 Line=485 Dir=Fwd Pos=56	Drift-V
1056	LoadID=42 Line=485 Dir=Fwd Pos=57	Drift-V
1057	LoadID=42 Line=485 Dir=Fwd Pos=58	Drift-V
1058	LoadID=42 Line=485 Dir=Fwd Pos=59	Drift-V
1059	LoadID=42 Line=485 Dir=Fwd Pos=60	Drift-V
1060	LoadID=42 Line=485 Dir=Fwd Pos=61	Drift-V
1061	LoadID=42 Line=485 Dir=Fwd Pos=62	Drift-V
1062	LoadID=42 Line=485 Dir=Fwd Pos=63	Drift-V
1063	LoadID=42 Line=485 Dir=Fwd Pos=64	Drift-V
1064	LoadID=42 Line=485 Dir=Fwd Pos=65	Drift-V
1065	LoadID=42 Line=485 Dir=Fwd Pos=66	Drift-V
1066	LoadID=42 Line=485 Dir=Fwd Pos=67	Drift-V
1067	LoadID=42 Line=485 Dir=Fwd Pos=68	Drift-V
1068	LoadID=42 Line=485 Dir=Fwd Pos=69	Drift-V
1069	LoadID=42 Line=485 Dir=Fwd Pos=70	Drift-V

1070 LoadID=42 Line=485 Dir=Fwd Pos=71 Drift-V

1071 LoadID=42 Line=485 Dir=Fwd Pos=72 Drift-V

1072 LoadID=42 Line=485 Dir=Fwd Pos=73 Drift-V

1073 LoadID=42 Line=485 Dir=Fwd Pos=74 Drift-V

1074 LoadID=42 Line=485 Dir=Fwd Pos=75 Drift-V

1075 LoadID=42 Line=485 Dir=Fwd Pos=76 Drift-V

1076 LoadID=42 Line=485 Dir=Fwd Pos=77 Drift-V

1077 LoadID=42 Line=485 Dir=Fwd Pos=78 Drift-V

1078 LoadID=42 Line=485 Dir=Fwd Pos=79 Drift-V

1079 LoadID=42 Line=485 Dir=Fwd Pos=80 Drift-V

1080 LoadID=42 Line=485 Dir=Fwd Pos=81 Drift-V

1081 LoadID=42 Line=485 Dir=Fwd Pos=82 Drift-V

1082 LoadID=42 Line=485 Dir=Fwd Pos=83 Drift-V

1083 LoadID=42 Line=485 Dir=Fwd Pos=84 Drift-V

1084 LoadID=42 Line=485 Dir=Fwd Pos=85 Drift-V

1085 LoadID=42 Line=485 Dir=Fwd Pos=86 Drift-V

1086 LoadID=42 Line=485 Dir=Fwd Pos=87 Drift-V

1087 LoadID=42 Line=485 Dir=Fwd Pos=88 Drift-V

1088 LoadID=42 Line=485 Dir=Fwd Pos=89 Drift-V

1089 LoadID=42 Line=485 Dir=Fwd Pos=90 Drift-V

1090 LoadID=42 Line=485 Dir=Fwd Pos=91 Drift-V

1091 LoadID=42 Line=485 Dir=Fwd Pos=92 Drift-V

1092 LoadID=42 Line=485 Dir=Fwd Pos=93 Drift-V

1093 LoadID=42 Line=485 Dir=Fwd Pos=94 Drift-V

1094 LoadID=42 Line=485 Dir=Fwd Pos=95 Drift-V

1095 LoadID=42 Line=485 Dir=Fwd Pos=96 Drift-V

1096 LoadID=42 Line=485 Dir=Fwd Pos=97 Drift-V

1097 LoadID=42 Line=485 Dir=Fwd Pos=98 Drift-V

1098 LoadID=42 Line=485 Dir=Fwd Pos=99 Drift-V

1099 LoadID=42 Line=485 Dir=Fwd Pos=100 Drift-V

1100 LoadID=42 Line=485 Dir=Fwd Pos=101 Drift-V

1101 LoadID=42 Line=485 Dir=Fwd Pos=102 Drift-V

1102 LoadID=42 Line=485 Dir=Fwd Pos=103 Drift-V

1103	LoadID=42 Line=485 Dir=Fwd Pos=104	Drift-V
1104	LoadID=42 Line=485 Dir=Fwd Pos=105	Drift-V
1105	LoadID=42 Line=485 Dir=Fwd Pos=106	Drift-V
2000	LoadID=42 Line=486 Dir=Fwd Pos=1	Drift-V
2001	LoadID=42 Line=486 Dir=Fwd Pos=2	Drift-V
2002	LoadID=42 Line=486 Dir=Fwd Pos=3	Drift-V
2003	LoadID=42 Line=486 Dir=Fwd Pos=4	Drift-V
2004	LoadID=42 Line=486 Dir=Fwd Pos=5	Drift-V
2005	LoadID=42 Line=486 Dir=Fwd Pos=6	Drift-V
2006	LoadID=42 Line=486 Dir=Fwd Pos=7	Drift-V
2007	LoadID=42 Line=486 Dir=Fwd Pos=8	Drift-V
2008	LoadID=42 Line=486 Dir=Fwd Pos=9	Drift-V
2009	LoadID=42 Line=486 Dir=Fwd Pos=10	Drift-V
2010	LoadID=42 Line=486 Dir=Fwd Pos=11	Drift-V
2011	LoadID=42 Line=486 Dir=Fwd Pos=12	Drift-V
2012	LoadID=42 Line=486 Dir=Fwd Pos=13	Drift-V
2013	LoadID=42 Line=486 Dir=Fwd Pos=14	Drift-V
2014	LoadID=42 Line=486 Dir=Fwd Pos=15	Drift-V
2015	LoadID=42 Line=486 Dir=Fwd Pos=16	Drift-V
2016	LoadID=42 Line=486 Dir=Fwd Pos=17	Drift-V
2017	LoadID=42 Line=486 Dir=Fwd Pos=18	Drift-V
2018	LoadID=42 Line=486 Dir=Fwd Pos=19	Drift-V
2019	LoadID=42 Line=486 Dir=Fwd Pos=20	Drift-V
2020	LoadID=42 Line=486 Dir=Fwd Pos=21	Drift-V
2021	LoadID=42 Line=486 Dir=Fwd Pos=22	Drift-V
2022	LoadID=42 Line=486 Dir=Fwd Pos=23	Drift-V
2023	LoadID=42 Line=486 Dir=Fwd Pos=24	Drift-V
2024	LoadID=42 Line=486 Dir=Fwd Pos=25	Drift-V
2025	LoadID=42 Line=486 Dir=Fwd Pos=26	Drift-V
2026	LoadID=42 Line=486 Dir=Fwd Pos=27	Drift-V
2027	LoadID=42 Line=486 Dir=Fwd Pos=28	Drift-V
2028	LoadID=42 Line=486 Dir=Fwd Pos=29	Drift-V
2029	LoadID=42 Line=486 Dir=Fwd Pos=30	Drift-V
2030	LoadID=42 Line=486 Dir=Fwd Pos=31	Drift-V

2031	LoadID=42 Line=486 Dir=Fwd Pos=32	Drift-V
2032	LoadID=42 Line=486 Dir=Fwd Pos=33	Drift-V
2033	LoadID=42 Line=486 Dir=Fwd Pos=34	Drift-V
2034	LoadID=42 Line=486 Dir=Fwd Pos=35	Drift-V
2035	LoadID=42 Line=486 Dir=Fwd Pos=36	Drift-V
2036	LoadID=42 Line=486 Dir=Fwd Pos=37	Drift-V
2037	LoadID=42 Line=486 Dir=Fwd Pos=38	Drift-V
2038	LoadID=42 Line=486 Dir=Fwd Pos=39	Drift-V
2039	LoadID=42 Line=486 Dir=Fwd Pos=40	Drift-V
2040	LoadID=42 Line=486 Dir=Fwd Pos=41	Drift-V
2041	LoadID=42 Line=486 Dir=Fwd Pos=42	Drift-V
2042	LoadID=42 Line=486 Dir=Fwd Pos=43	Drift-V
2043	LoadID=42 Line=486 Dir=Fwd Pos=44	Drift-V
2044	LoadID=42 Line=486 Dir=Fwd Pos=45	Drift-V
2045	LoadID=42 Line=486 Dir=Fwd Pos=46	Drift-V
2046	LoadID=42 Line=486 Dir=Fwd Pos=47	Drift-V
2047	LoadID=42 Line=486 Dir=Fwd Pos=48	Drift-V
2048	LoadID=42 Line=486 Dir=Fwd Pos=49	Drift-V
2049	LoadID=42 Line=486 Dir=Fwd Pos=50	Drift-V
2050	LoadID=42 Line=486 Dir=Fwd Pos=51	Drift-V
2051	LoadID=42 Line=486 Dir=Fwd Pos=52	Drift-V
2052	LoadID=42 Line=486 Dir=Fwd Pos=53	Drift-V
2053	LoadID=42 Line=486 Dir=Fwd Pos=54	Drift-V
2054	LoadID=42 Line=486 Dir=Fwd Pos=55	Drift-V
2055	LoadID=42 Line=486 Dir=Fwd Pos=56	Drift-V
2056	LoadID=42 Line=486 Dir=Fwd Pos=57	Drift-V
2057	LoadID=42 Line=486 Dir=Fwd Pos=58	Drift-V
2058	LoadID=42 Line=486 Dir=Fwd Pos=59	Drift-V
2059	LoadID=42 Line=486 Dir=Fwd Pos=60	Drift-V
2060	LoadID=42 Line=486 Dir=Fwd Pos=61	Drift-V
2061	LoadID=42 Line=486 Dir=Fwd Pos=62	Drift-V
2062	LoadID=42 Line=486 Dir=Fwd Pos=63	Drift-V
2063	LoadID=42 Line=486 Dir=Fwd Pos=64	Drift-V
2064	LoadID=42 Line=486 Dir=Fwd Pos=65	Drift-V

2065	LoadID=42 Line=486 Dir=Fwd Pos=66	Drift-V
2066	LoadID=42 Line=486 Dir=Fwd Pos=67	Drift-V
2067	LoadID=42 Line=486 Dir=Fwd Pos=68	Drift-V
2068	LoadID=42 Line=486 Dir=Fwd Pos=69	Drift-V
2069	LoadID=42 Line=486 Dir=Fwd Pos=70	Drift-V
2070	LoadID=42 Line=486 Dir=Fwd Pos=71	Drift-V
2071	LoadID=42 Line=486 Dir=Fwd Pos=72	Drift-V
2072	LoadID=42 Line=486 Dir=Fwd Pos=73	Drift-V
2073	LoadID=42 Line=486 Dir=Fwd Pos=74	Drift-V
2074	LoadID=42 Line=486 Dir=Fwd Pos=75	Drift-V
2075	LoadID=42 Line=486 Dir=Fwd Pos=76	Drift-V
2076	LoadID=42 Line=486 Dir=Fwd Pos=77	Drift-V
2077	LoadID=42 Line=486 Dir=Fwd Pos=78	Drift-V
2078	LoadID=42 Line=486 Dir=Fwd Pos=79	Drift-V
2079	LoadID=42 Line=486 Dir=Fwd Pos=80	Drift-V
2080	LoadID=42 Line=486 Dir=Fwd Pos=81	Drift-V
2081	LoadID=42 Line=486 Dir=Fwd Pos=82	Drift-V
2082	LoadID=42 Line=486 Dir=Fwd Pos=83	Drift-V
2083	LoadID=42 Line=486 Dir=Fwd Pos=84	Drift-V
2084	LoadID=42 Line=486 Dir=Fwd Pos=85	Drift-V
2085	LoadID=42 Line=486 Dir=Fwd Pos=86	Drift-V
2086	LoadID=42 Line=486 Dir=Fwd Pos=87	Drift-V
2087	LoadID=42 Line=486 Dir=Fwd Pos=88	Drift-V
2088	LoadID=42 Line=486 Dir=Fwd Pos=89	Drift-V
2089	LoadID=42 Line=486 Dir=Fwd Pos=90	Drift-V
2090	LoadID=42 Line=486 Dir=Fwd Pos=91	Drift-V
2091	LoadID=42 Line=486 Dir=Fwd Pos=92	Drift-V
2092	LoadID=42 Line=486 Dir=Fwd Pos=93	Drift-V
2093	LoadID=42 Line=486 Dir=Fwd Pos=94	Drift-V
2094	LoadID=42 Line=486 Dir=Fwd Pos=95	Drift-V
2095	LoadID=42 Line=486 Dir=Fwd Pos=96	Drift-V
2096	LoadID=42 Line=486 Dir=Fwd Pos=97	Drift-V
2097	LoadID=42 Line=486 Dir=Fwd Pos=98	Drift-V
2098	LoadID=42 Line=486 Dir=Fwd Pos=99	Drift-V

2099	LoadID=42 Line=486 Dir=Fwd Pos=100	Drift-V
2100	LoadID=42 Line=486 Dir=Fwd Pos=101	Drift-V
2101	LoadID=42 Line=486 Dir=Fwd Pos=102	Drift-V
2102	LoadID=42 Line=486 Dir=Fwd Pos=103	Drift-V
2103	LoadID=42 Line=486 Dir=Fwd Pos=104	Drift-V
2104	LoadID=42 Line=486 Dir=Fwd Pos=105	Drift-V
2105	LoadID=42 Line=486 Dir=Fwd Pos=106	Drift-V
2108	qx = +0.5kN/m	Drift-V
2109	qx = -0.5kN/m	Drift-V
2110	OVER-2	Drift-V
2111	OVER-1	Drift-V
2112	OJTEMP+	Drift-V
2114	VIND+	Drift-V
2115	VIND-	Drift-V
2118	JTEMP 1	Drift-V
2119	JTEMP 2	Drift-V
2198	Px = +49 kN	Drift-V
2199	Px = -49 kN	Drift-V
3	EGEN_1-1	Stage I
4	EGEN_1-3	Stage I
9	EGEN_1-2	Stage I
10	EGEN_1-4	Stage I
11	EGEN_1-5	Stage I
14	FORM+	Stage I
6	EGEN_2	Stage II
7	EGEN_3	Stage III

24. Basic combination

Loadcase ID: 12 Title: EGEN_1

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
3	0	1.0	EGEN_1-1	
4	0	1.0	EGEN_1-3	
9	0	1.0	EGEN_1-2	
10	0	1.0	EGEN_1-4	
11	0	1.0	EGEN_1-5	

Loadcase ID: 13 Title: EGEN

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
12	0	1.0	EGEN_1	
6	0	1.0	EGEN_2	
7	0	1.0	EGEN_3	

Loadcase ID: 28 Title: STOD 1Y-

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
25	0	-1.0	STOD 1Y+	

Loadcase ID: 29 Title: STOD 2Y-

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
26	0	-1.0	STOD 2Y+	

Loadcase ID: 30 Title: STOD 3Y-

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
27	0	-1.0	STOD 3Y+	

Loadcase ID: 2113 Title: OJTEMP-

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
2112	0	-1.0	OJTEMP+	

Loadcase ID: 2122 Title: BROMS-V

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
2109	0	0.83	qx = -0.5kN/m	
2123	0	1.0	JORD 1	

Loadcase ID: 2125 Title: JORD

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
2123	0	1.0	JORD 1	
2124	0	1.0	JORD 2	

Loadcase ID: 2126 Title: BROMS-H

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
2108	0	1.0	qx = +0.5kN/m	
2124	0	0.83	JORD 2	

Loadcase ID: 2136 Title: KRYMP

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
37	0	1.0	KRYMP-1	
38	0	1.0	KRYMP-2	
39	0	1.0	KRYMP-3	
40	0	1.0	KRYMP-4	

Loadcase ID: 2197 Title: JTEMP

Sub Type: Basic Combination

Loadcase	Results File	Factor	Title	Type
2118	0	1.0	JTEMP 1	
2119	0	1.0	JTEMP 2	

25. Smart combination

Loadcase ID: 31 Title: STOD-Y

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
25	0	0.0	1.0	STOD 1Y+	
26	0	0.0	1.0	STOD 2Y+	
27	0	0.0	1.0	STOD 3Y+	
28	0	0.0	1.0	STOD 1Y-	
29	0	0.0	1.0	STOD 2Y-	
30	0	0.0	1.0	STOD 3Y-	

Loadcase ID: 33 Title: STOD-Z

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
22	0	0.0	1.0	STOD_1Z	
23	0	0.0	1.0	STOD_2Z	
24	0	0.0	1.0	STOD_3Z	

Loadcase ID: 2127 Title: OVER

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2111	0	0.0	1.0	OVER-1	
2110	0	0.0	1.0	OVER-2	

Loadcase ID: 2129 Title: ULS-BP
Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
13	0	1.0	0.35	EGEN	
14	0	1.0	0.35	FORM+	

Loadcase ID: 2132 Title: ULS-DP
Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
13	0	1.0	0.2	EGEN	
15	0	1.0	0	FORM-	
16	0	1.0	0.2	BELAGG	
2125	0	1.0	0.2	JORD	
35	0	0.0	1.2	STOD (Max)	
36	0	0.0	1.2	STOD (Min)	

Loadcase ID: 2134 Title: ULS-DK
Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2136	0	0.0	1.2	KRYMP	

Loadcase ID: 2137 Title: ULS-DV
Sub Type: Smart Combination
Loadcases to consider: 5
Variable Loadcases: 1

Loadcase	**Results File**	**Permanent Factor**	**Variable Factor**	**Title**	**Type**
2139	0	0.0	1.5	BROMS (Max)	
2140	0	0.0	1.5	BROMS (Min)	
2127	0	1.13	0.37	OVER (Max)	
2128	0	1.13	0.37	OVER (Min)	
2141	0	0.9	0.6	TEMP (Max)	
2142	0	0.9	0.6	TEMP (Min)	
2116	0	0.45	1.05	VIND (Max)	
2117	0	0.45	1.05	VIND (Min)	
2147	0	0.6	0.9	TRAFIK (Max)	
2148	0	0.6	0.9	TRAFIK (Min)	

Loadcase ID: 2141 Title: TEMP

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	**Results File**	**Permanent Factor**	**Variable Factor**	**Title**	**Type**
2112	0	0.0	1.0	OJTEMP+	
2113	0	0.0	1.0	OJTEMP-	
2197	0	0.0	1.0	JTEMP	

Loadcase ID: 2143 Title: GC-1

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	**Results**	**Permanent**	**Variable**	**Title**	**Type**

	File	Factor	Factor	
41	0	0.0	1.0	Ytlast 1-1
42	0	0.0	1.0	Ytlast 1-2
43	0	0.0	1.0	Ytlast 1-3
44	0	0.0	1.0	Ytlast 1-4
45	0	0.0	1.0	Ytlast 2-1
46	0	0.0	1.0	Ytlast 2-2
47	0	0.0	1.0	Ytlast 2_3
48	0	0.0	1.0	Ytlast 2-4
49	0	0.0	1.0	Ytlast 3-1
50	0	0.0	1.0	Ytlast 3-2
51	0	0.0	1.0	Ytlast 3-3
52	0	0.0	1.0	Ytlast 3-4
53	0	0.0	1.0	Ytlast 4-1
54	0	0.0	1.0	Ytlast 4-2
55	0	0.0	1.0	Ytlast 4-3
56	0	0.0	1.0	Ytlast 4-4

Loadcase ID: 2149 Title: SLS-PERM

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results	Permanent	Variable	Title	Type

	File	Factor	Factor		
13	0	1.0	0.0	EGEN	
2131	0	1.0	0.0	FORM	
16	0	0.9	0.2	BELAGG	
2125	0	1.0	0.0	JORD	
35	0	0.0	1.0	STOD (Max)	
36	0	0.0	1.0	STOD (Min)	

Loadcase ID: 2151 Title: SLS-DK

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2136	0	0.0	1.0	KRYMP	

Loadcase ID: 2153 Title: SLS-VAR-K

Sub Type: Smart Combination
Loadcases to consider: 5
Variable Loadcases: 1

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
	0		1.0		

2139 0.0 BROMS (Max)
0
1.0
2140 0.0 BROMS (Min)
0
0.25
2127 0.75 OVER (Max)
0.25
0
2128 0.75 OVER (Min)
0
0.4
2141 0.6 TEMP (Max)
0
0.4
2142 0.6 TEMP (Min)
0.7
0
2116 0.3 VIND (Max)
0
0.7
2117 0.3 VIND (Min)
0
0.6
2147 0.4 TRAFIK (Max)

0
0.6
2148 0.4 TRAFIK (Min)

Loadcase ID: 2155 Title: SLS-VAR-F

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase **Results File** **Permanent Factor** **Variable Factor** **Title** **Type**
0
0.75
2127 0.0 OVER (Max)
0

2128		0.0	0.75	OVER (Min)	
2141	0	0.0	0.6	TEMP (Max)	
2142	0	0.0	0.6	TEMP (Min)	
2116	0	0.0	0.2	VIND (Max)	
2117	0	0.0	0.2	VIND (Min)	
2147	0	0.0	0.4	TRAFIK (Max)	
2148	0	0.0	0.4	TRAFIK (Min)	

Loadcase ID: 2157 Title: SLS-VAR-Q

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2141	0	0.0	0.5	TEMP (Max)	
2142	0	0.0	0.5	TEMP (Min)	

Loadcase ID: 2159 Title: SLS-K

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2149	0	1.0	0.0	SLS-PERM (Max)	
2150	0	1.0	0.0	SLS-PERM (Min)	
	0		1.0		

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2151		0.0		SLS-DK (Max)	
2152	0	0.0	1.0	SLS-DK (Min)	
2153	0	0.0	1.0	SLS-VAR-K (Max)	
2154	0	0.0	1.0	SLS-VAR-K (Min)	

Loadcase ID: 2161 Title: SLS-F

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2149	0	1.0	0.0	SLS-PERM (Max)	
2150	0	1.0	0.0	SLS-PERM (Min)	
2151	0	0.0	1.0	SLS-DK (Max)	
2152	0	0.0	1.0	SLS-DK (Min)	
2155	0	0.0	1.0	SLS-VAR-F (Max)	
2156	0	0.0	1.0	SLS-VAR-F (Min)	

Loadcase ID: 2163 Title: SLS-Q

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2149	0	1.0	0.0	SLS-PERM (Max)	
2150	0	1.0	0.0	SLS-PERM (Min)	

2151	0	0.0	1.0	SLS-DK (Max)	
2152	0	0.0	1.0	SLS-DK (Min)	
2157	0	0.0	1.0	SLS-VAR-Q (Max)	
2158	0	0.0	1.0	SLS-VAR-Q (Min)	

Loadcase ID: 2165 Title: ULS-Phase 1

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
13	0	1.0	0.2	EGEN	
14	0	1.2	0.0	FORM+	

Loadcase ID: 2167 Title: ULS-Phase 2a

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
16	0	1.0	0.2	BELAGG	
2125	0	1.0	0.2	JORD	
15	0	1.2	0.0	FORM-	

Loadcase ID: 2169 Title: ULS-Phase 2b

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
35	0	0.0	1.2	STOD (Max)	
36	0	0.0	1.2	STOD (Min)	
2136	0	0.0	1.0	KRYMP	

Loadcase ID: 2171 Title: ULS-Phase 3a

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2141	0	0.0	0.9	TEMP (Max)	
2142	0	0.0	0.9	TEMP (Min)	

Loadcase ID: 2173 Title: ULS-Phase 3b

Sub Type: Smart Combination
Loadcases to consider: 4
Variable Loadcases: 1

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2139	0	0.0	1.0	BROMS (Max)	
2140	0	0.0	1.0	BROMS (Min)	
2127	0	0.75	0.25	OVER (Max)	
2128	0	0.75	0.25	OVER (Min)	
2116	0	0.3	0.7	VIND (Max)	
2117	0	0.3	0.7	VIND (Min)	
2147	0	0.4	0.6	TRAFIK (Max)	
2148	0	0.4	0.6	TRAFIK (Min)	

Loadcase ID: 2175 Title: SLS C-Phase 1

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
13	0	1.0	0.0	EGEN	
14	0	1.0	0.0	FORM+	

Loadcase ID: 2179   Title: SLS C-Phase 2a
Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
16	0	1.0	0.0	BELAGG	
2125	0	0.9	0.2	JORD	
15	0	1.0	0.0	FORM-	

Loadcase ID: 2181   Title: SLS C-Phase 2b
Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
35	0	0.0	1.0	STOD (Max)	
36	0	0.0	1.0	STOD (Min)	
2136	0	0.0	1.0	KRYMP	

Loadcase ID: 2183   Title: SLS C-Phase 3a
Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2141	0	0.0	1.0	TEMP (Max)	
2142	0	0.0	1.0	TEMP (Min)	

Loadcase ID: 2185   Title: SLS C-Phase 3b
Sub Type: Smart Combination
Loadcases to consider: 4
Variable Loadcases: 1

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2139	0	0.0	1.0	BROMS (Max)	
2140	0	0.0	1.0	BROMS (Min)	
	0		0.25		

2127 0.75 OVER (Max)
0
0.25
2128 0.75 OVER (Min)
0
0.7
2116 0.3 VIND (Max)
0.7
0
2117 0.3 VIND (Min)
0
0.6
2147 0.4 TRAFIK (Max)
0
0.6
2148 0.4 TRAFIK (Min)

Loadcase ID: 2187 Title: SLS F-Phase 1
Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
	0		0.0		
13		1.0		EGEN	
	0		0.0		
14		1.0		FORM+	

Loadcase ID: 2189 Title: SLS F-Phase 2a
Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
			0.0		
	0				
16		1.0		BELAGG	
	0		0.2		
2125		0.9		JORD	
	0		0.0		
15		1.0		FORM-	

Loadcase ID: 2191 Title: SLS F-Phase 2b

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
35	0	0.0	1.0	STOD (Max)	
36	0	0.0	1.0	STOD (Min)	
2136	0	0.0	1.0	KRYMP	

Loadcase ID: 2193 Title: SLS F-Phase 3a

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2141	0	0.0	1.0	TEMP (Max)	
2142	0	0.0	1.0	TEMP (Min)	

Loadcase ID: 2195 Title: SLS F-Phase 3b

Sub Type: Smart Combination
Loadcases to consider: All
Variable Loadcases: All

Loadcase	Results File	Permanent Factor	Variable Factor	Title	Type
2127	0	0.0	0.75	OVER (Max)	
2128	0	0.0	0.75	OVER (Min)	
2116	0	0.0	0.2	VIND (Max)	
2117	0	0.0	0.2	VIND (Min)	
			0.4		

	0			
2147		0.0		TRAFIK (Max)
	0			
			0.4	
2148		0.0		TRAFIK (Min)