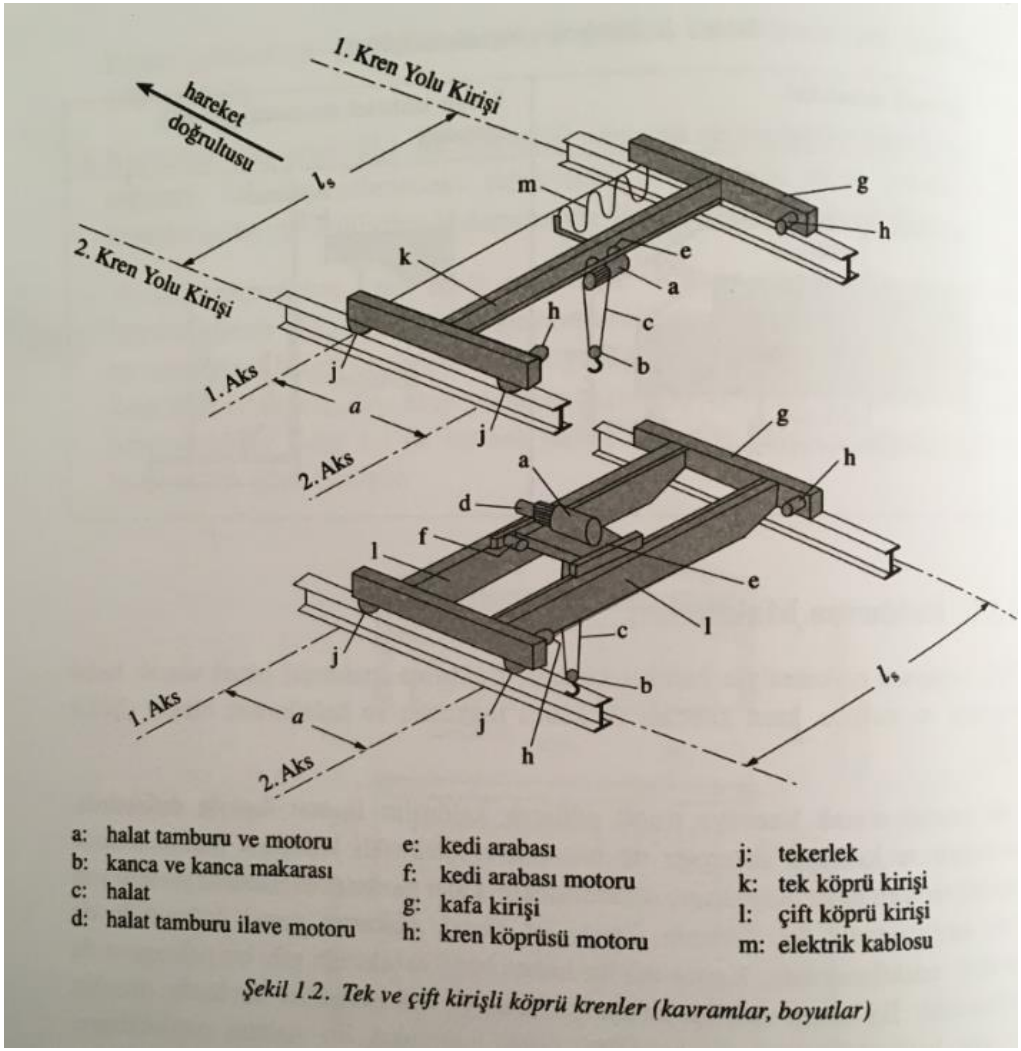
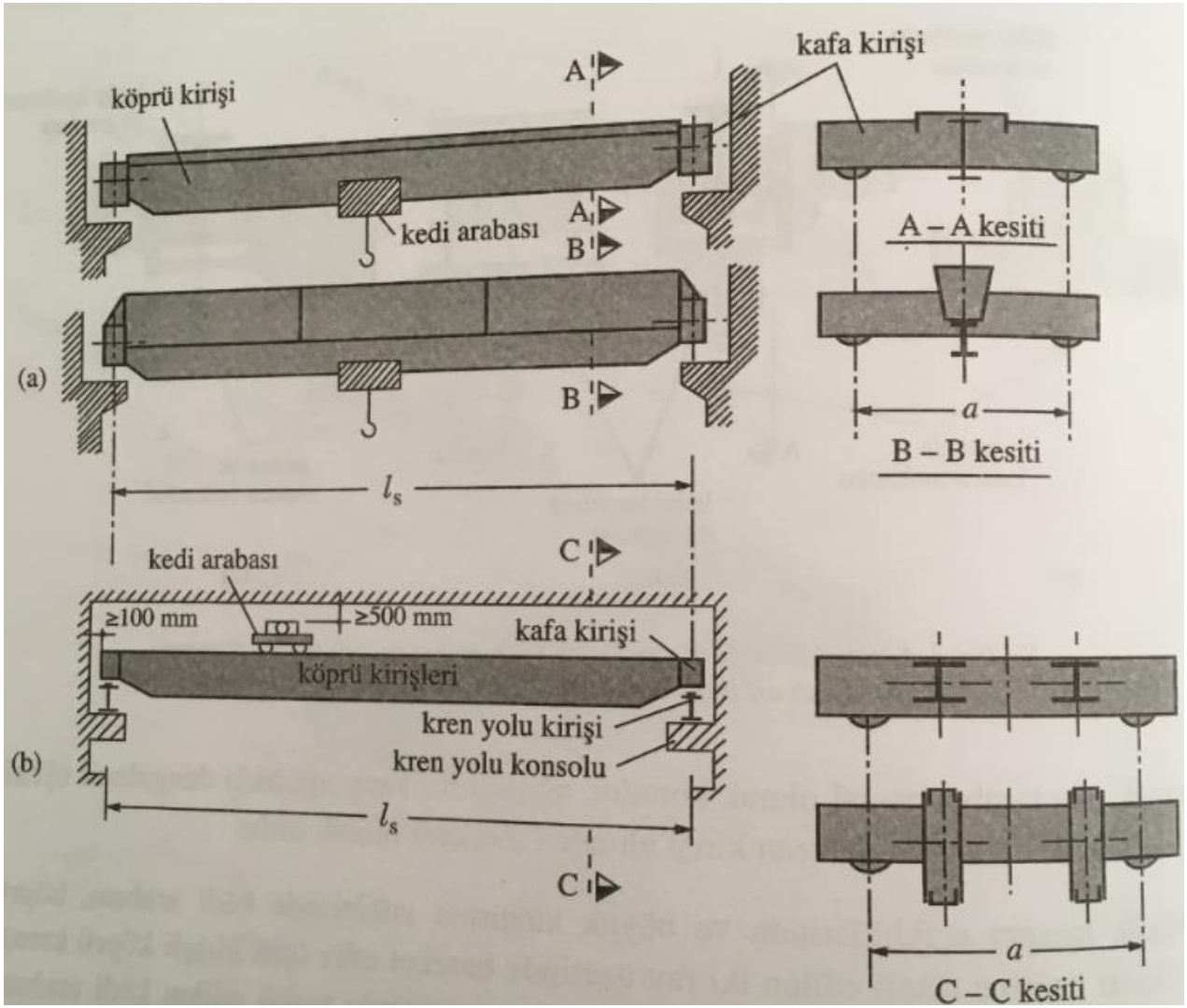
KREN YOLLARININ HESABI

GENEL KAVRAMLAR

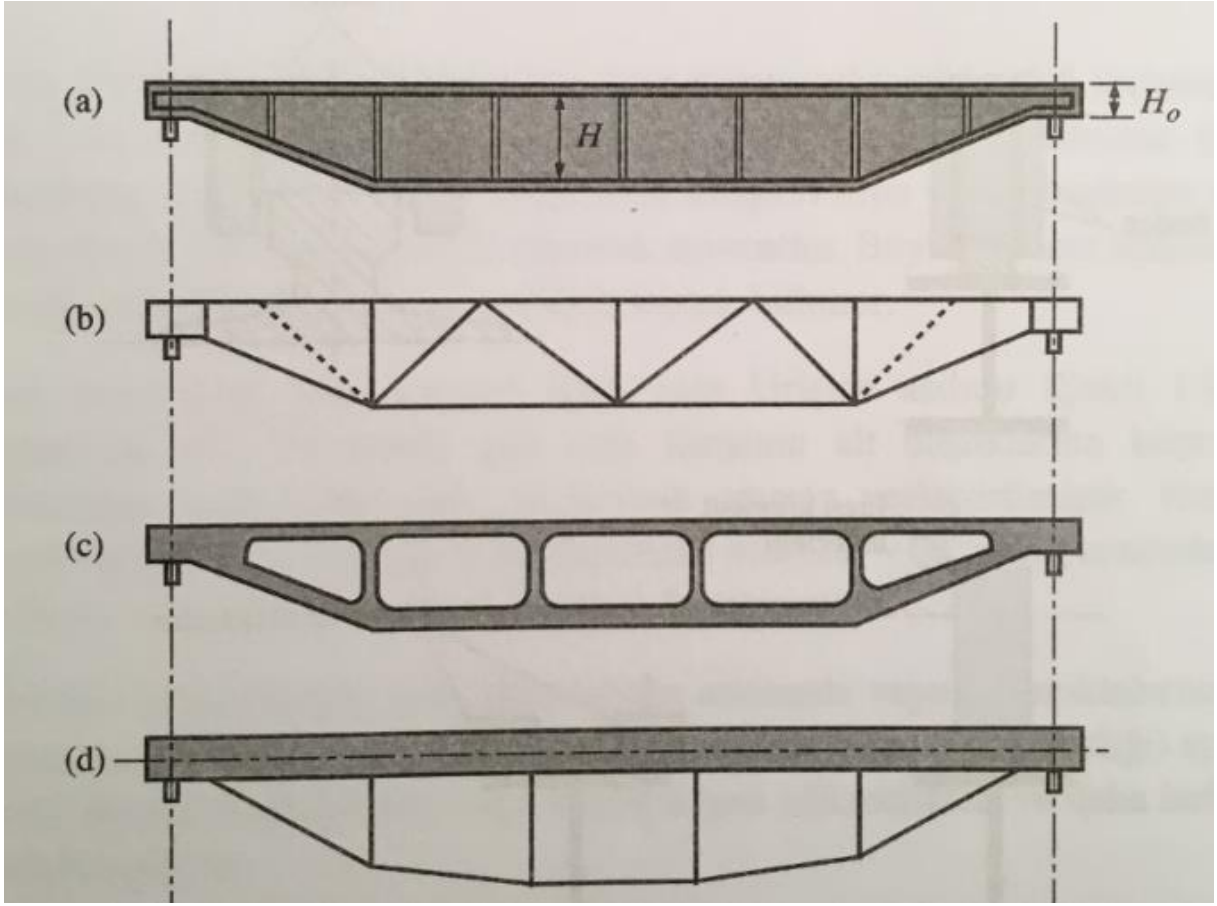


a: halat tamburu ve motoru
b: kanca ve kanca makarası
c: halat
d: halat tamburu ilave motoru
e: kedi arabası
f: kedi arabası motoru
g: kafa kirişi
h: kren köprüsü motoru
j: tekerlek
k: tek köprü kirişi
l: çift köprü kirişi
m: elektrik kablosu

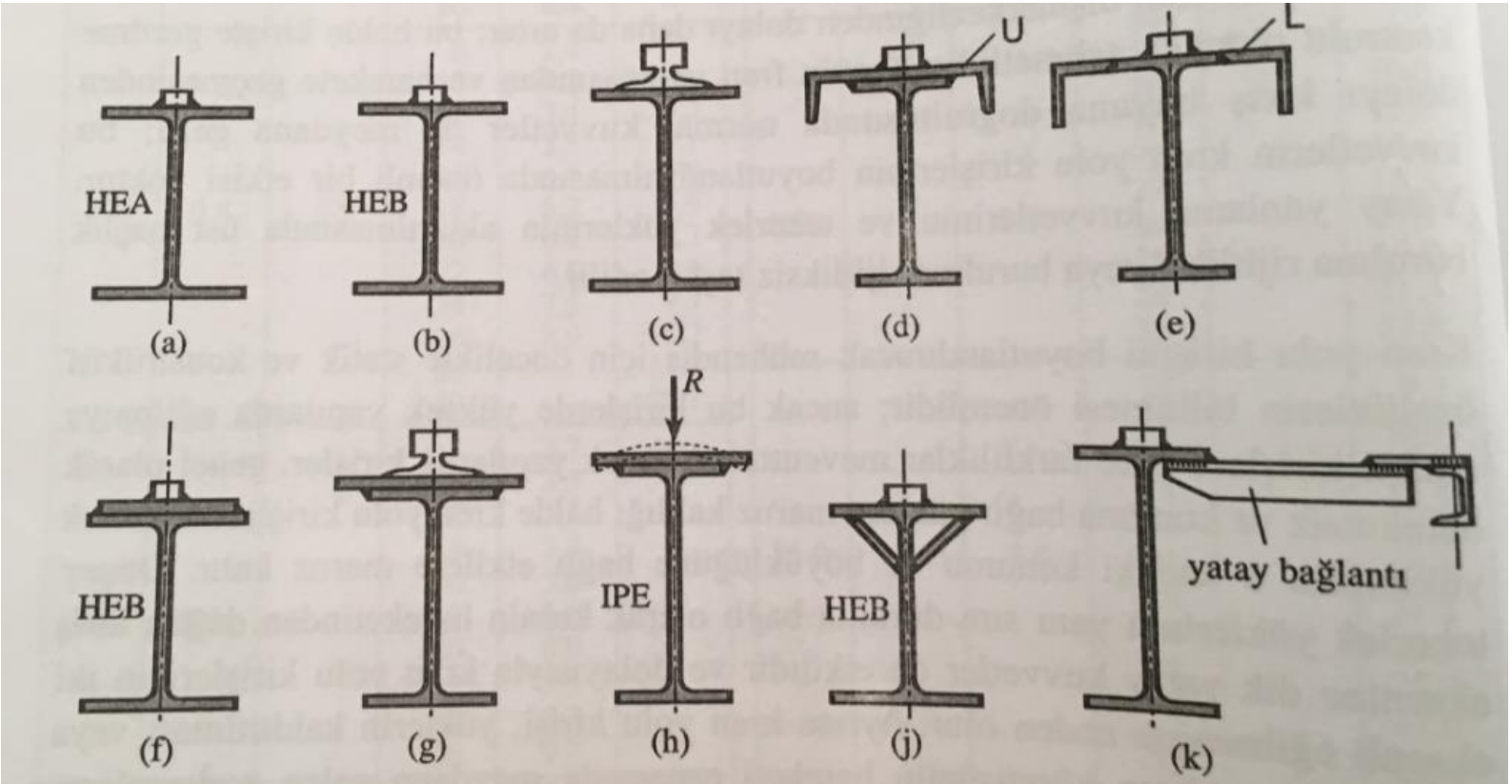
Şekil 1.2. Tek ve çift kirişli köprü krenler (kavramlar, boyutlar)


kafa kirişi
köprü kirişi
A
A
B
kedi arabası
A – A kesiti
(a)
B
B – B kesiti
a
l_s
C
kedi arabası
≥100 mm
≥500 mm
kafa kirişi
köprü kirişleri
kren yolu kirişi
kren yolu konsolu
(b)
l_s
C
a
C – C kesiti

KİRİŞ TİPLERİ

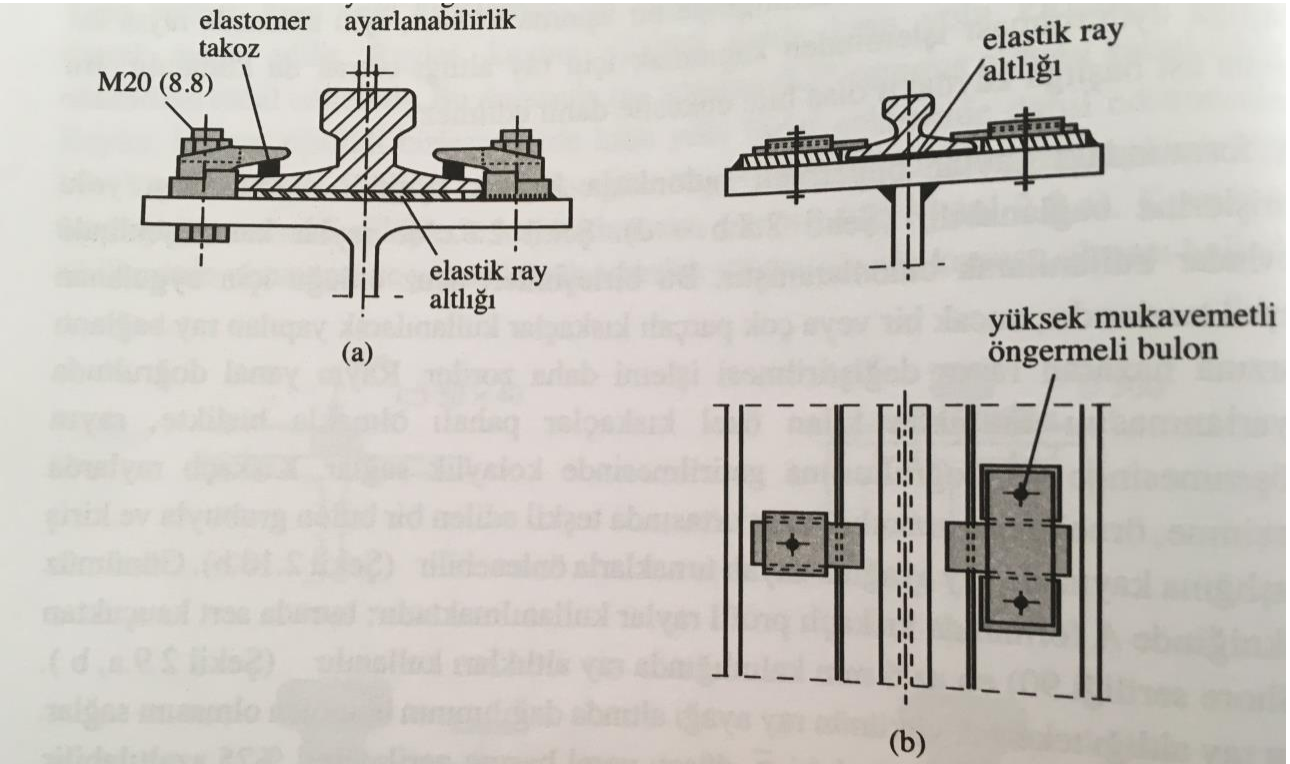


YAPMA KİRİŞ KESİTLERİ

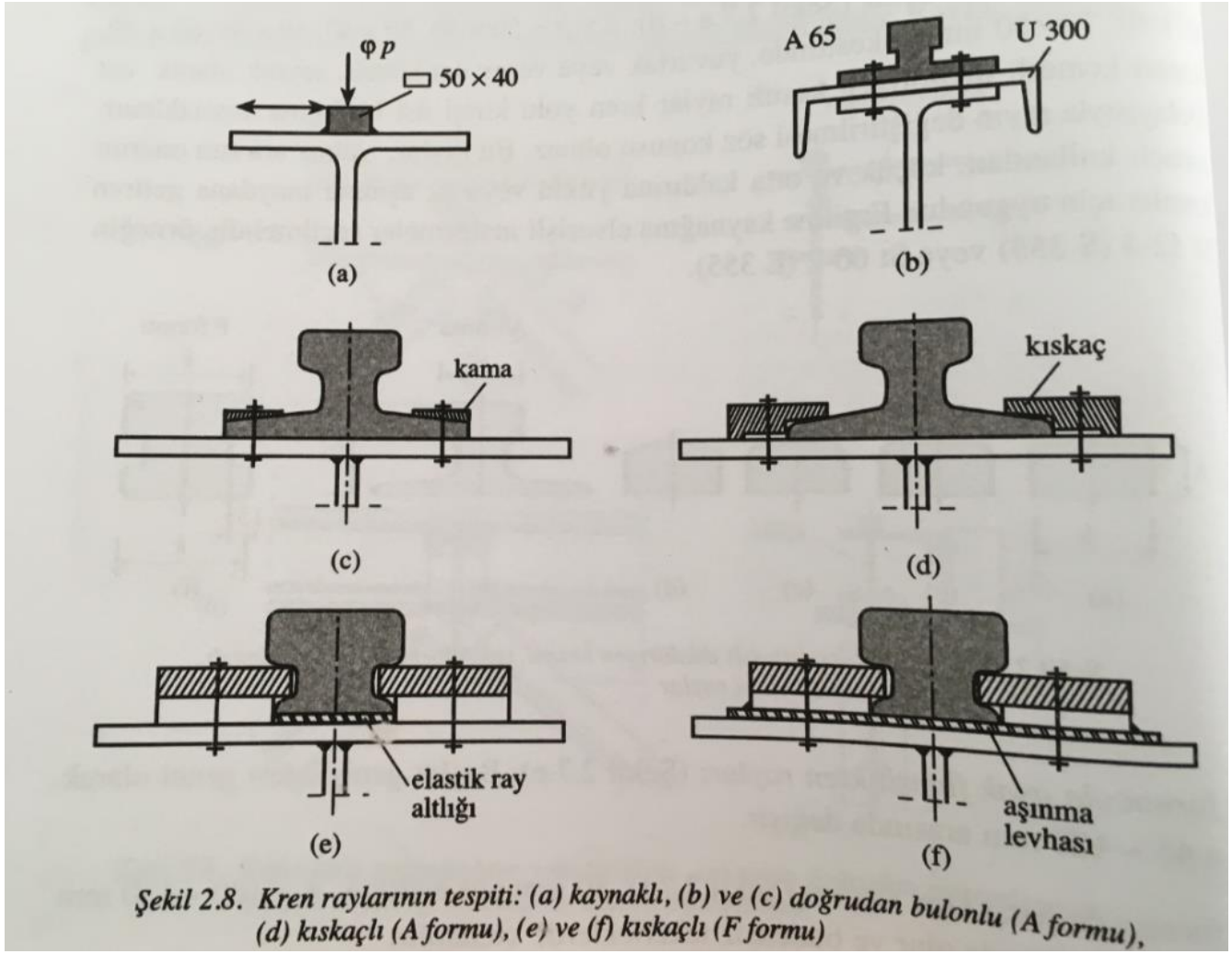


Şekil 2.1. Kren yolu kirişi enkesitleri: (a)~(c) takviyesiz hadde profilleri, (d)~(j) takviyeli hadde profilleri

RAY BAĞLANTI DETAYLARI



Şekil 2.9. Kren raylarının (A formu) (a) elastik ve ayarlanabilir, (b) kılavuz levhalı bulonlu tespiti



Şekil 2.8. Kren raylarının tespiti: (a) kaynaklı, (b) ve (c) doğrudan bulonlu (A formu), (d) kıskaçlı (A formu), (e) ve (f) kıskaçlı (F formu)


VINÇSAN A.Ş.
2x15 TON
2x15 TON
2X10 TON

EN1991-3, 2006'ya Göre Hesap

Dinamik Artırma Katsayıları

Table 2.1 — Dynamic factors φ_i

Dynamic factors	Effects to be considered	To be applied to
φ_1	– excitation of the crane structure due to lifting the hoist load off the ground	self-weight of the crane
φ_2 or φ_3	–dynamic effects of transferring the hoist load from the ground to the crane –dynamic effects of sudden release of the payload if for example grabs or magnets are used	hoist load
φ_4	–dynamic effects induced when the crane is travelling on rail tracks or runways	self-weight of the crane and hoist load
φ_5	–dynamic effects caused by drive forces	drive forces
φ_6	–dynamic effects of a test load moved by the drives in the way the crane is used	test load
φ_7	–dynamic elastic effects of impact on buffers	buffer loads

Dinamik Artırma Katsayılarının Her bir Yüklemede Kullanılacak Değerleri

Table 2.2 — Groups of loads and dynamic factors to be considered as one characteristic crane action

		Symbol	Section	Groups of loads									
				Ultimate Limit State							Test load	Acci-dental	
				1	2	3	4	5	6	7	8	9	10
1	Self-weight of crane	Q_c	2.6	φ_1	φ_1	1	φ_4	φ_4	φ_4	1	φ_1	1	1
2	Hoist load	Q_h	2.6	φ_2	φ_3	-	φ_4	φ_4	φ_4	η [1)]	-	1	1
3	Acceleration of crane bridge	H_L, H_T	2.7	φ_5	φ_5	φ_5	φ_5	-	-	-	φ_5	-	-
4	Skewing of crane bridge	H_S	2.7	-	-	-	-	1	-	-	-	-	-
5	Acceleration or braking of crab or hoist block	H_{T3}	2.7	-	-	-	-	-	1	-	-	-	-
6	In-service wind	F_W *	Annex A	1	1	1	1	1	-	-	1	-	-
7	Test load	Q_T	2.10	-	-	-	-	-	-	-	φ_6	-	-
8	Buffer force	H_B	2.11	-	-	-	-	-	-	-	-	φ_7	-
9	Tilting force	H_{TA}	2.11	-	-	-	-	-	-	-	-	-	1

NOTE: For out of service wind, see Annex A.

[1] η is the proportion of the hoist load that remains when the payload is removed, but is not included in the self-weight of the crane.

Kren Kirişlerinin Hol içindeki Pozisyonları

Table 2.3 — Recommended maximum number of cranes to be considered in the most unfavourable position

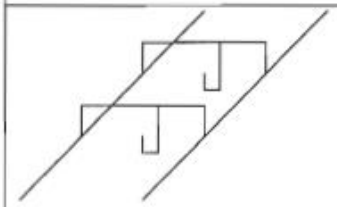
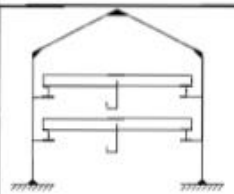
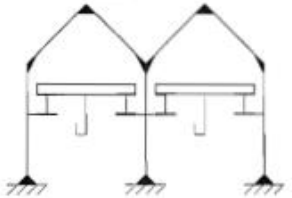
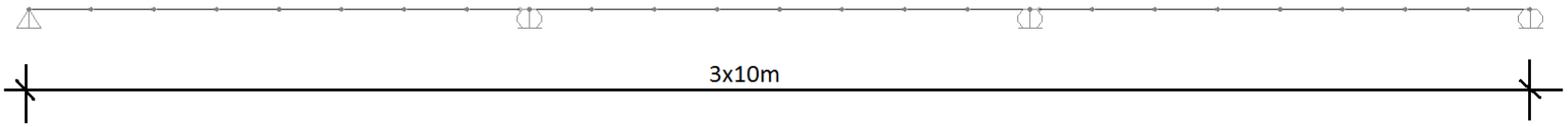
	Cranes to each runway	Cranes in each shop bay	Cranes in multi – bay buildings	
				
Vertical crane action	3	4	4	2
Horizontal crane action	2	2	2	2

Table 2.4 — Dynamic factors φ_i for vertical loads

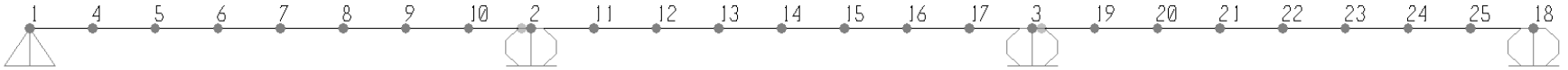
	Values of dynamic factors
φ_1	$0{,}9 < \varphi_1 < 1{,}1$ The two values 1,1 and 0,9 reflect the upper and lower values of the vibrational pulses.
φ_2	$\varphi_2 = \varphi_{2,min} + \beta_2 v_h$ v_h - steady hoisting speed in m/s $\varphi_{2,min}$ and β_2 see Table 2.5
φ_3	$\varphi_3 = 1 - \frac{\Delta m}{m}(1 + \beta_3)$ where Δm released or dropped part of the hoisting mass m total hoisting mass $\beta_3 = 0{,}5$ for cranes equipped with grabs or similar slow-release devices $\beta_3 = 1{,}0$ For cranes equipped with magnets or similar rapid-release devices
φ_4	$\varphi_4 = 1{,}0$ provided that the tolerances for rail tracks as specified in EN 1993-6 are observed.
NOTE: If the tolerances for rail tracks as specified in EN 1993-6 are not observed, the dynamic factor φ_4 can be determined with the model provided by EN 13001-2.	

2x225 TON'LUK KRENYOLU HESABI

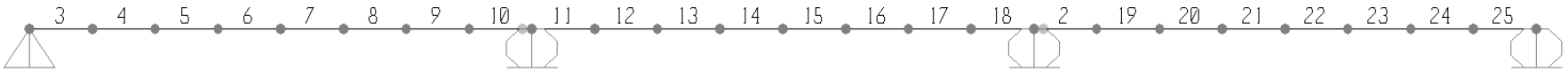
3 AÇIKLIKLI SAP2000 KREN KİRİŞİ MODELİ



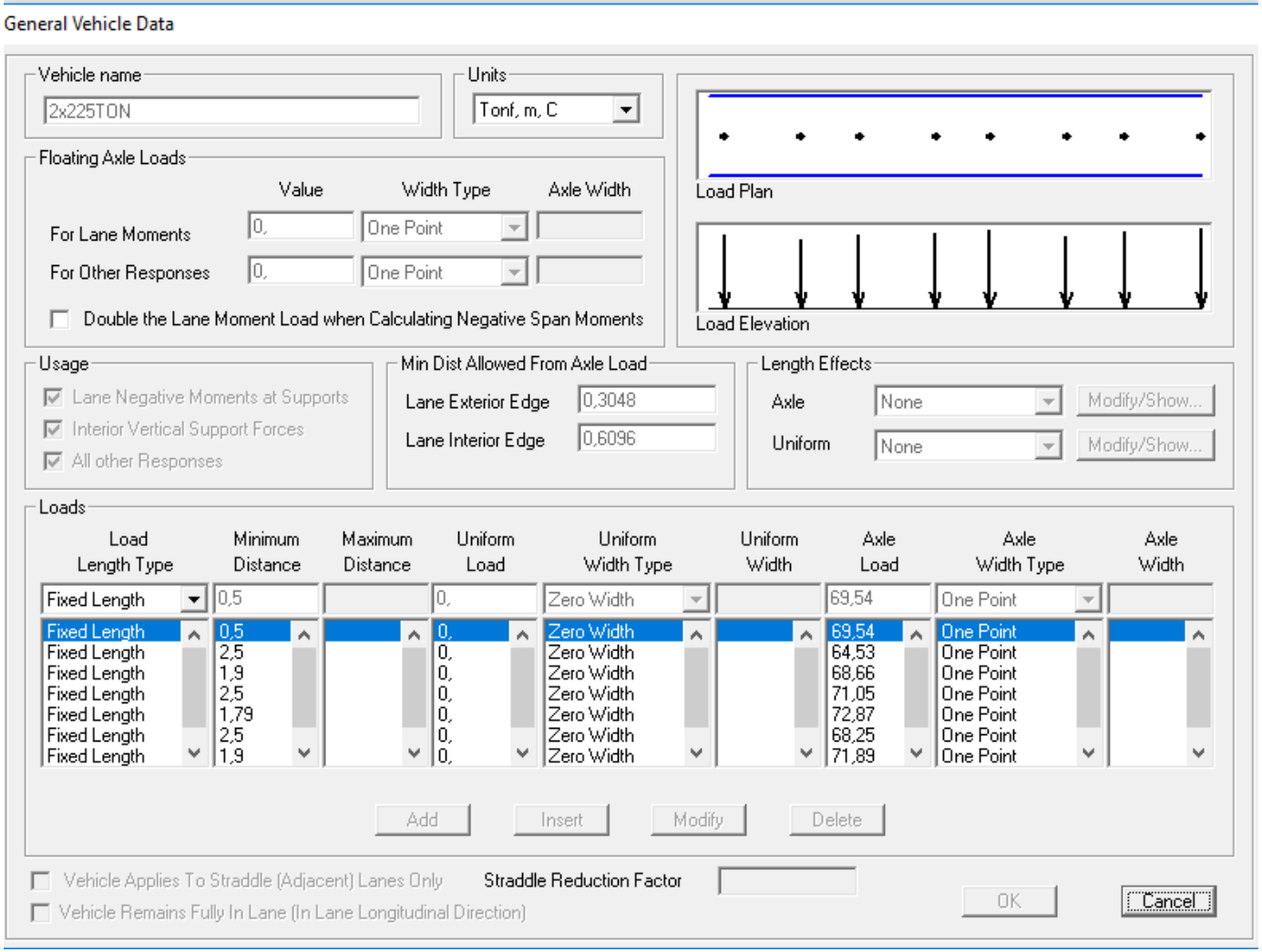
DÜĞÜM NOKTASI NUMARALARI



ÇUBUK NUMARALARI

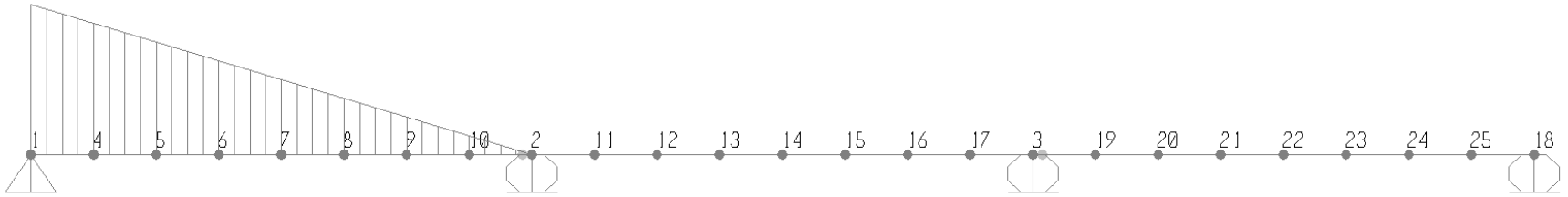


SAP2000'DE ARAÇ YÜKLERİNİN TANIMLANMASI (F)

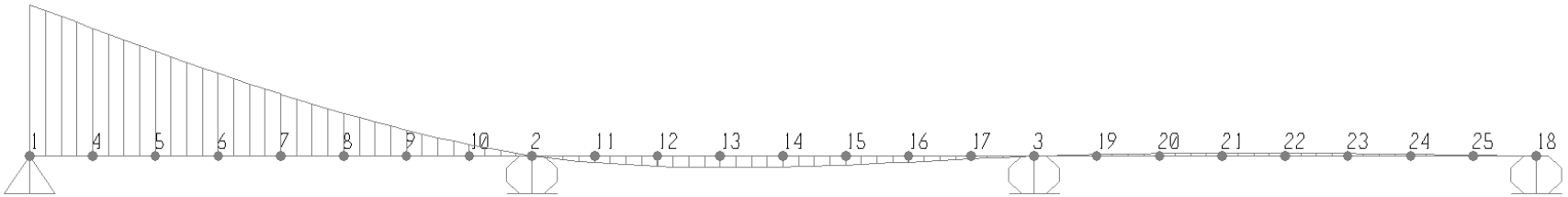


(1) NO'LU MESNETE AİT DÜŞEY MESNET TEPKİSİ TESİR ÇİZGİSİ

A- BASİT MESNETLİ

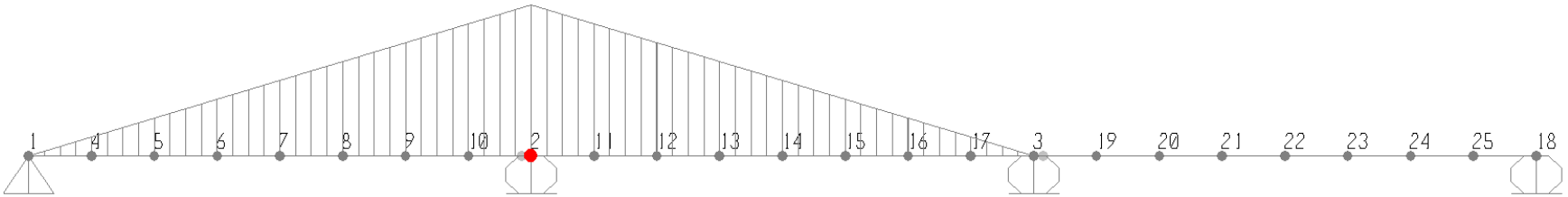


A- SÜREKLİ KİRİŞ

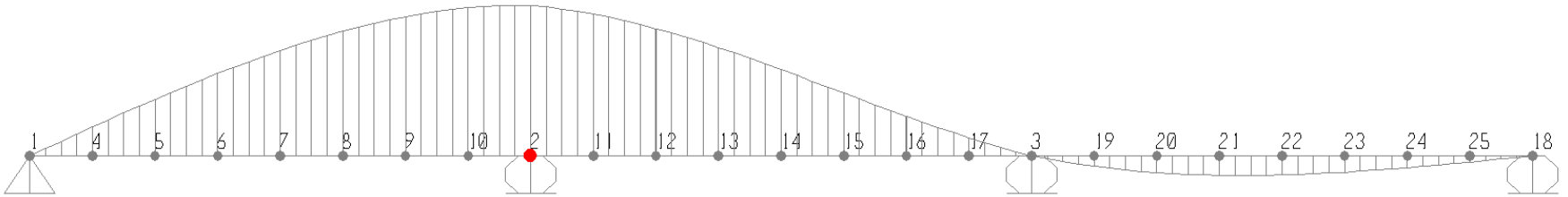


(2) NO'LU MESNETE AİT DÜŞEY MESNET TEPKİSİ TESİR ÇİZGİSİ

A- BASİT MESNETLİ

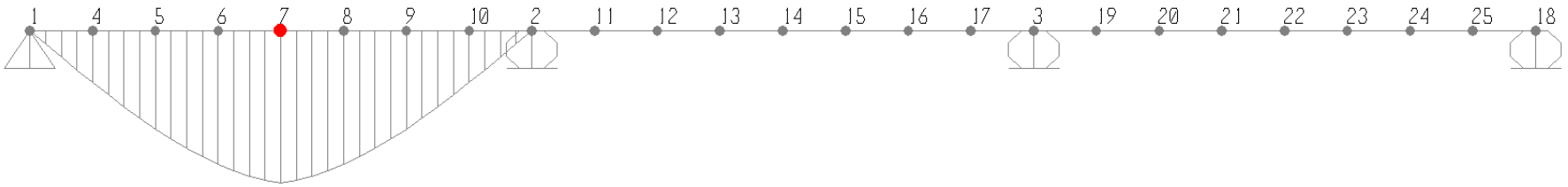


B- SÜREKLİ KİRİŞ

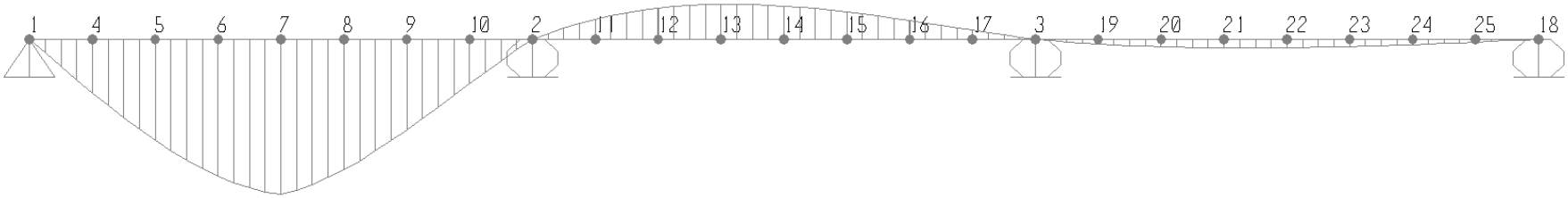


(7) NO'LU DÜĞÜM NOKTASINA AİT DÜŞEY YERDEĞİŞTİRME TESİR ÇİZGİSİ

A- BASİT MESNETLİ

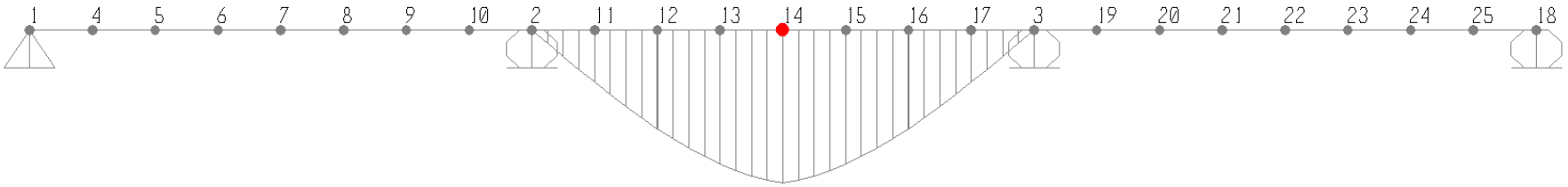


B- SÜREKLİ KİRİŞ

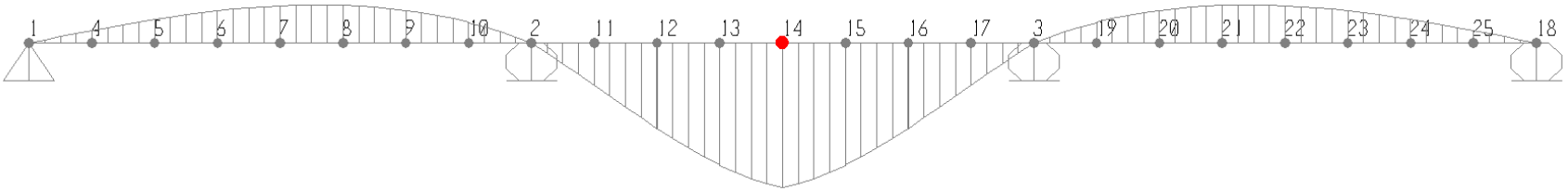


(14) NO'LU DÜĞÜM NOKTASINA AİT DÜŞEY YERDEĞİŞTİRME TESİR ÇİZGİSİ

A- BASİT MESNETLİ

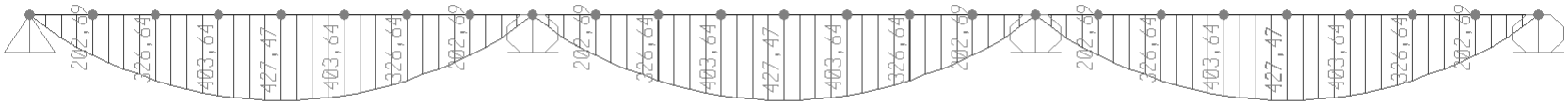


B- SÜREKLİ KİRİŞ



KATAR YÜKLEMESİ ALTINDA OLUŞAN EĞİLME MOMENTLERİ

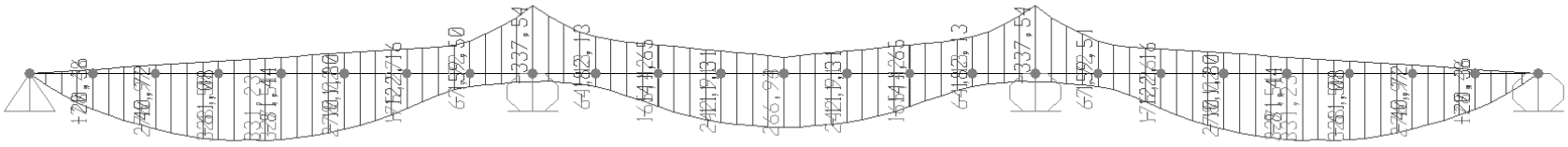
A- BASİT MESNETLİ



Mmax = 427 tm **Mmax = 427 tm** **Mmax = 427 tm**

B- SÜREKLİ KİRİŞ

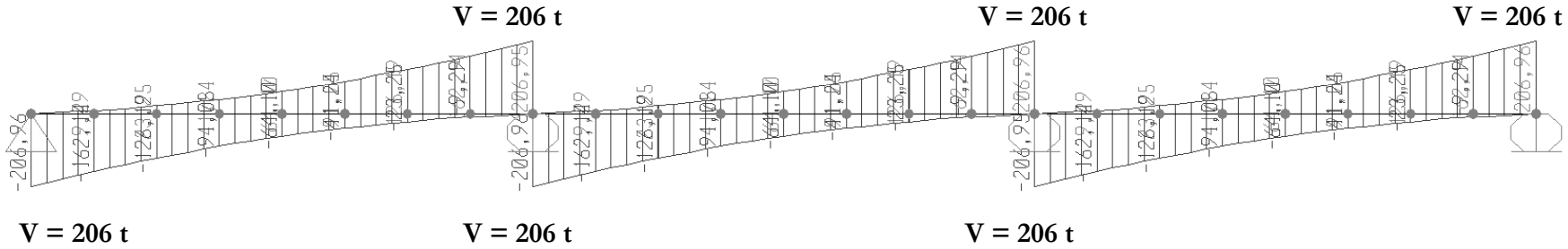
Mmin = -337 tm **Mmin = -337 tm**



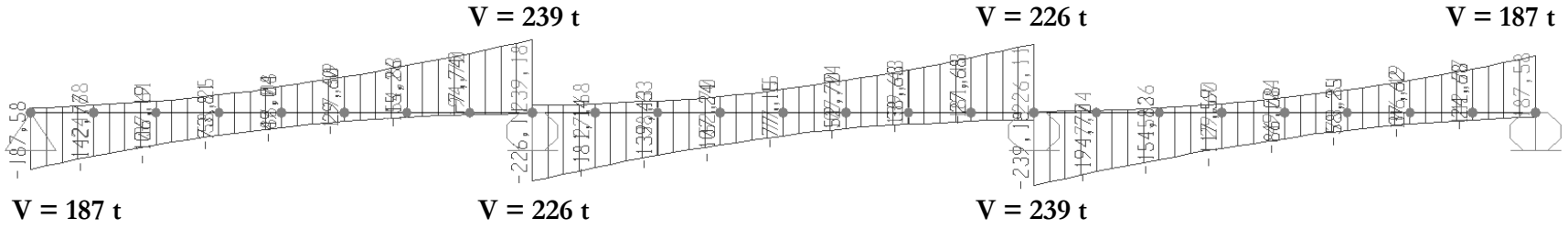
Mmax = 331 tm **Mmax = 267 tm** **Mmax = 331 tm**
Mmin = -81 tm **Mmin = -111 tm** **Mmin = -81 tm**

KATAR YÜKLEMESİ ALTINDA OLUŞAN KESME KUVVETLERİ

A- BASİT MESNETLİ

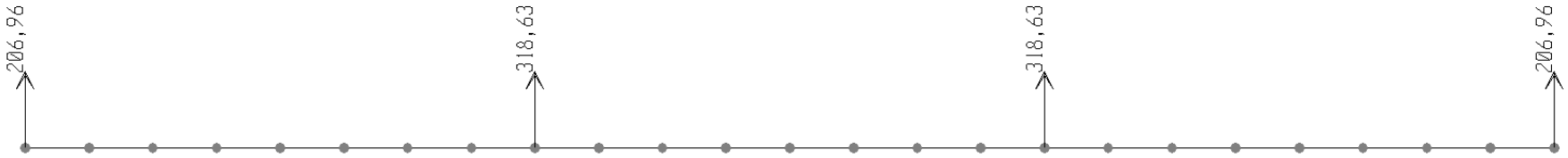


B- SÜREKLİ KİRİŞ



KATAR YÜKLEMESİ ALTINDA OLUŞAN MESNET TEPKİLERİ

A- BASİT MESNETLİ



B- SÜREKLİ KİRİŞ

KATAR YÜKLEMESİ ALTINDA OLUŞAN DÜŞEY YERDEĞİŞTİRMELER ZARFI

A- BASİT MESNETLİ

δmax = 8.6mm
(L / 1162)

B- SÜREKLİ KİRİŞ

δmax = 6.6mm
(L / 1515)

δmax = 5.36mm
(L / 1865)

δmax = 6.6mm
(L / 1515)

AYNI KİRİŞİN SONLU ELEMANLAR (KABUK) YÖNTEMİYLE İRDELENMESİ

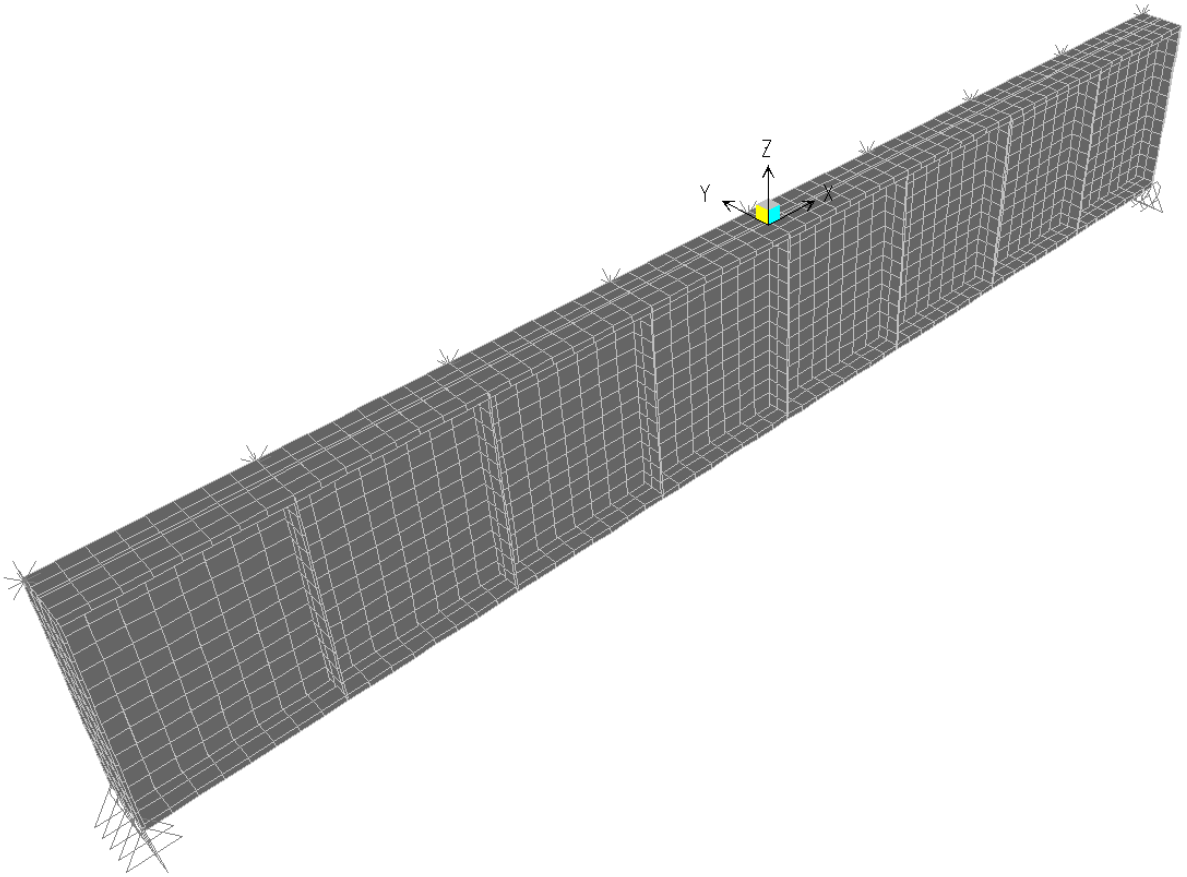
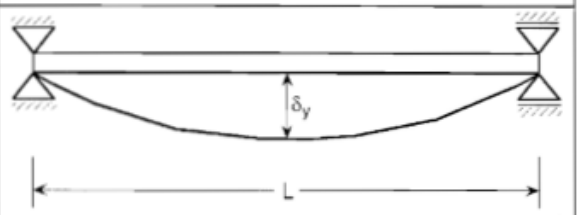


Table 7.1: Limiting values of horizontal deflections

Description of deflection (deformation or displacement)	Diagram
a) Horizontal deformation δ_y of a runway beam, measured at the level of the top of the crane rail: $\delta_y \leq L/600$	
b) Horizontal displacement δ_y of a frame (or of a column) at crane support level, due to crane loads: $\delta_y \leq h_c/400$ where: h_c is the height to the level at which the crane is supported (on a rail or on a flange)