



T.C. ULAŞTIRMA VE ALTYAPI BAKANLIĞI  
TÜRASAŞ GENEL MÜDÜRLÜĞÜ

TURASAS

ÖLÇEK

İL

PAFTA NO

1/50

Sakarya

001

İŞİN ADI  
TÜRASAŞ Sakarya Bölge Müdürlüğüne Ait Misafirhane Binasının Rölöve Projelerinin Çizimi,  
Performans Analizinin Yapılması ve Raporlanması İş Hizmet Alımı

PAFTA ADI

MİSAFİRHANE BİNASI YANGIN MERDİVENİ STATİK HESAP  
RAPORU

TASARIM

**ONAT**  
MÜHENDİSLİK PROJE

İŞİ

ÜNVANI

ADI SOYADI

İMZA

TARİH

Yapan

İnşaat Mühendisi

Seyit Ahmet YILMAZ

Kontrol

İnşaat Mühendisi

Alper METİN

Onay

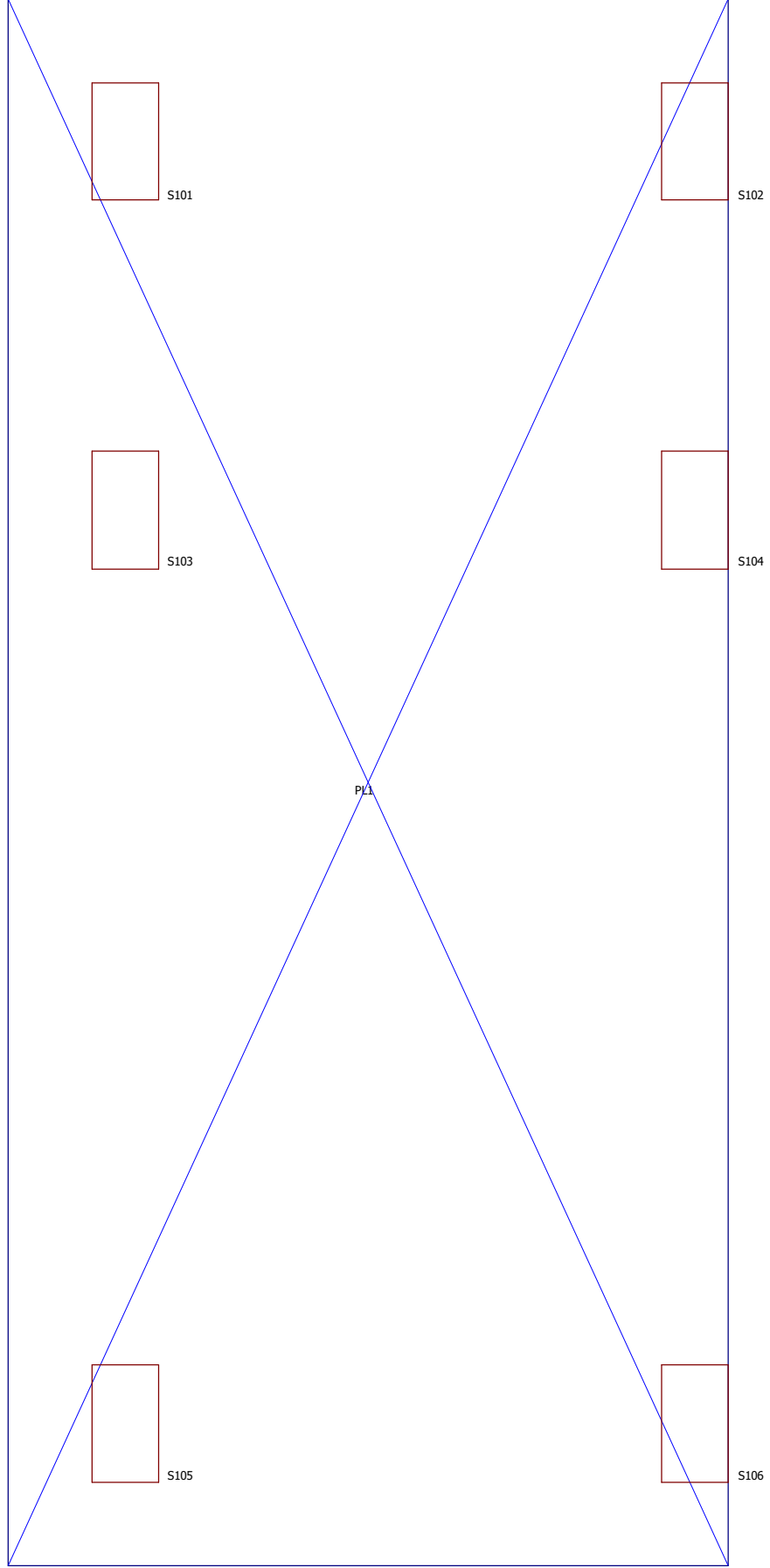
İnşaat Mühendisi

Alper METİN

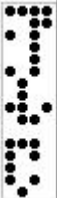
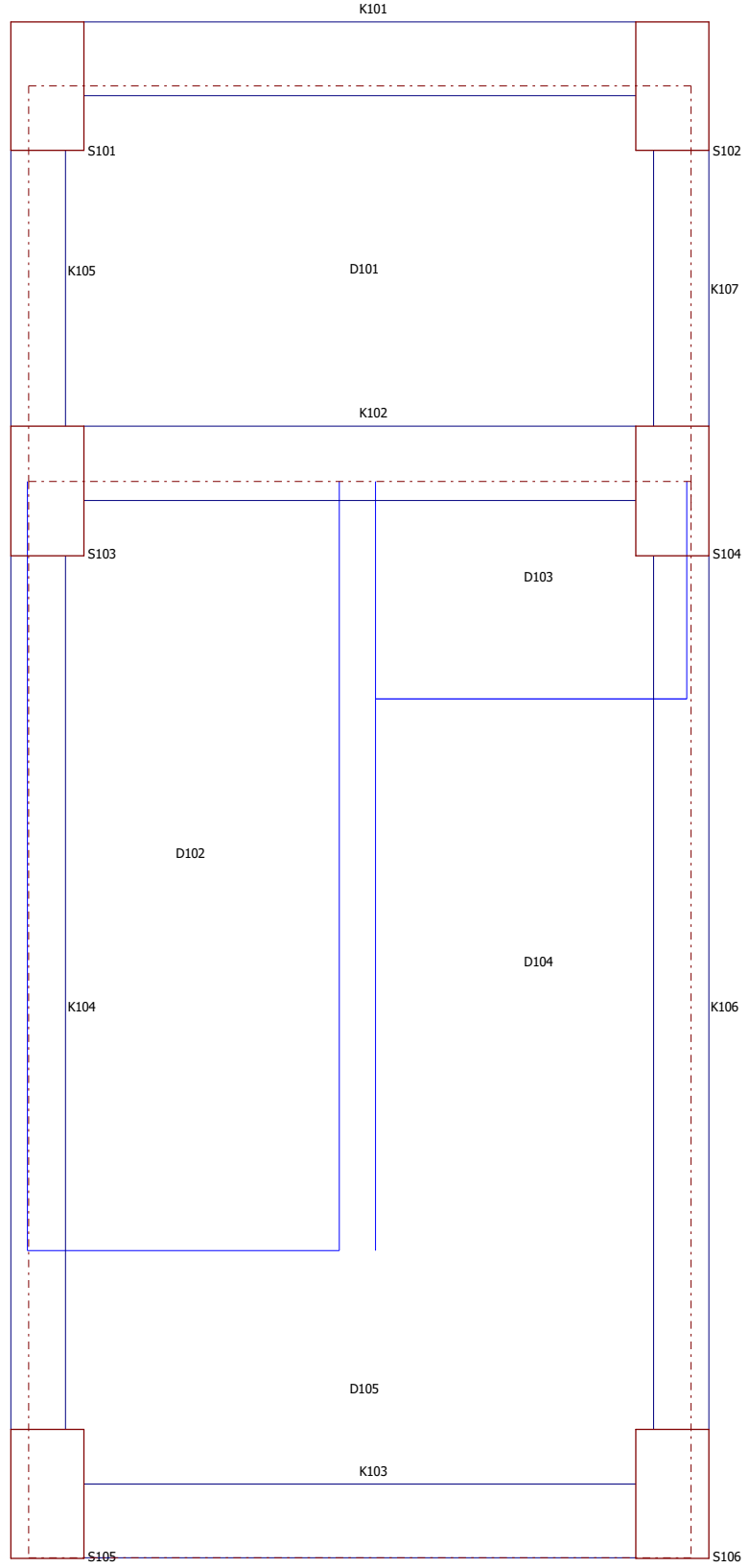
KONTROL TEŞKİLATI

ONAY

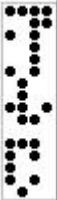
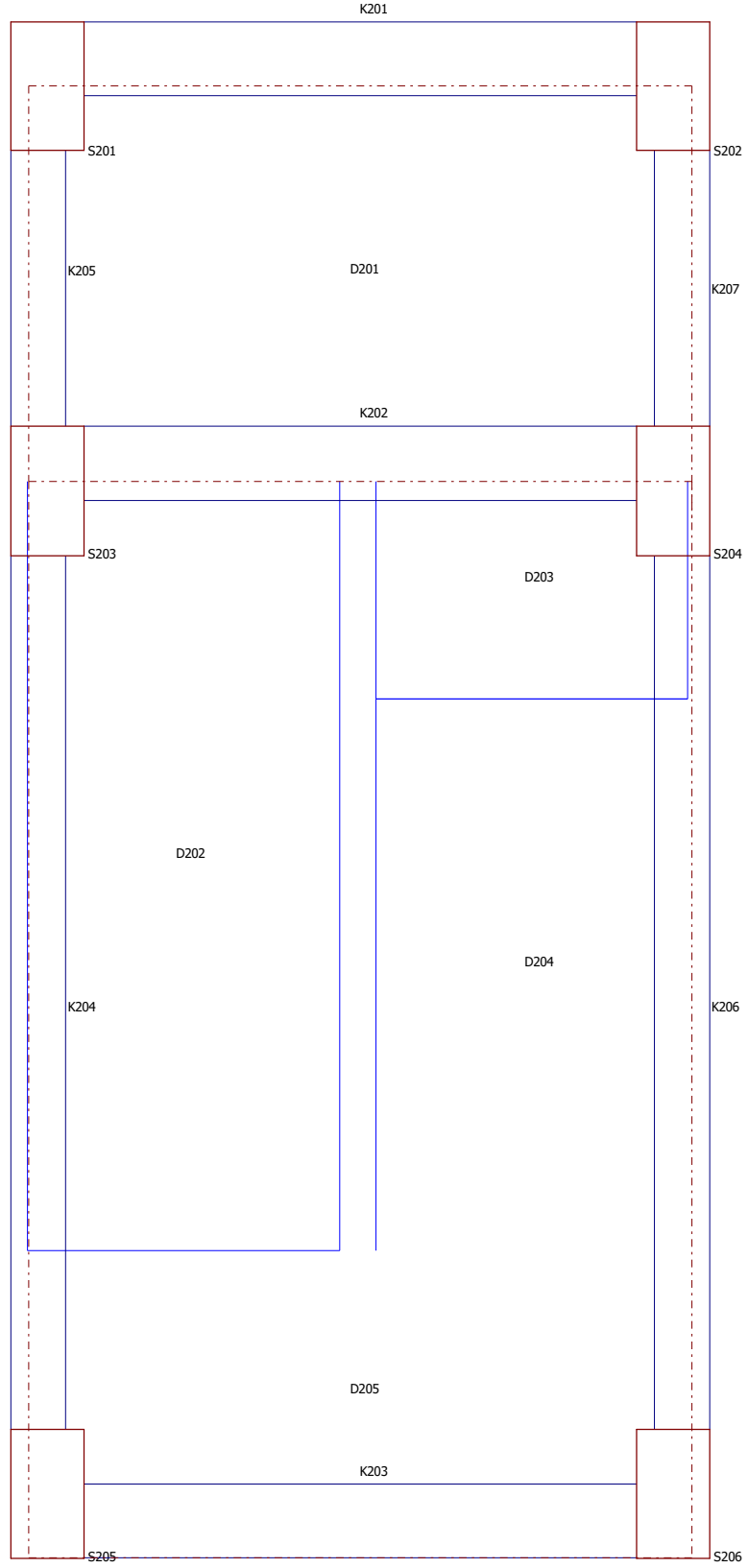
## TEMEL APLİKASYON PLANI



## 1. NORMAL KAT KALIP APLİKASYON PLANI



## 2. NORMAL KAT KALIP APLİKASYON PLANI



**STA4-CAD**  
**Structural Analysis FOR Computer Aided Design**  
**VERSION 14.1**  
**Copyright (C) 2018**

**STA MÜH. MÜŞ. LTD. ŞTİ.**

STA4 programı, çok katlı betonarme yapıların 3 boyutlu analizini ve entegre olarak çizimlerini yapan entegre paket programdır. Yapının tümü için global stifnes matrisi bir defada kurulur ve bloklama tekniği ile deplasmanlar bulunur. Kat düzlemindeki plakların yatay düzlemde sonsuz rijitliğini dikkate alarak, kat düzlemindeki  $\delta_x$ ,  $\delta_y$ ,  $\theta_z$  deplasmanları için her katta 3 bilinmeyen, eleman uçlarında  $\theta_x$ ,  $\theta_y$ ,  $\delta_z$  deplasmanları için her noktada 3 bilinmeyen kullanarak bir noktada 6 serbestlikli betonarme yapılara özgün stifnes matrisi ile çözülmektedir. Kiriş ve kolon elemanlarında kayma deformasyonları ile burulma etkileri dikkate alınmaktadır. Denklem takımını; çözümünün hızlı olabilmesi için uç nokta numaraları, program tarafından nokta optimizasyonu ile minimum hafızada çözecek şekilde düzenlenir. Yapı+temel birlikte çözülebilmekte olup, temel stifnes matrisleri winkler hipotezi ile kurulmaktadır.

Global stifnes matrisinde dikkate alınan hususlar:

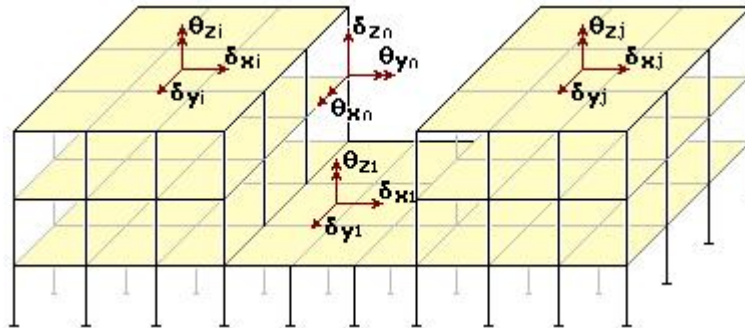
- Kirişlerin kolon ve perdeler içindeki kısımları, sonsuz rijit alınarak yük ve rijitlik matrislerinin düzenlenmesi.
- Geniş perdeler zayıf yönde saplanan kirişlerin, fiktif kolon kontrollü elastik ankastre olarak çözümü.
- Geniş perdeler rijitliği yönünde saplanan kirişlerde, kayma deformasyonların dikkate alınması.
- Altındaki kolon ile statik eksenlerinde kaçıklık olan kolonlarda, eksenel yük eksantirikliğinin stifnes matrisinde dikkate alınması.
- Dinamik analizde; CQC(Complete Quadratic Combination) metodu ile %5 sönüm yüzdesine göre kuvvetlerin bulunması.

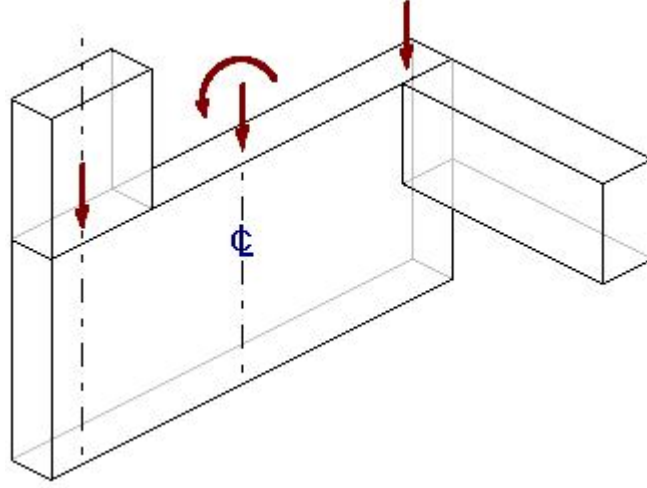
**STATİK ANALİZ YÜK KOMBİNASYON NOTASYONLARI:**

1. G+G+G+G+G : Genel ölü yük
2. Q+Q+Q+Q+Q : 1. Genel hareketli yük
3. Q+o+Q+o+Q : 2. Hareketli yük
4. o+Q+o+Q+o : 3. Hareketli yük
5. Q+Q+o+Q+Q : 4. Hareketli yük
6. o+Q+Q+o+Q : 5. Hareketli yük
7. Q+o+Q+Q+o : 6. Hareketli yük
8. Sz : Yatay zemin itkisi
9. Ex + %5 x ey : X yönü deprem + %5 eksantrisite
10. Ex - %5 x ey : X yönü deprem - %5 eksantrisite
11. Ey + %5 x ex : Y yönü deprem + %5 eksantrisite
12. Ey - %5 x ex : Y yönü deprem - %5 eksantrisite
13. Wx : X yönü rüzgar
14. Wy : Y yönü rüzgar
15. T : Isı yükü

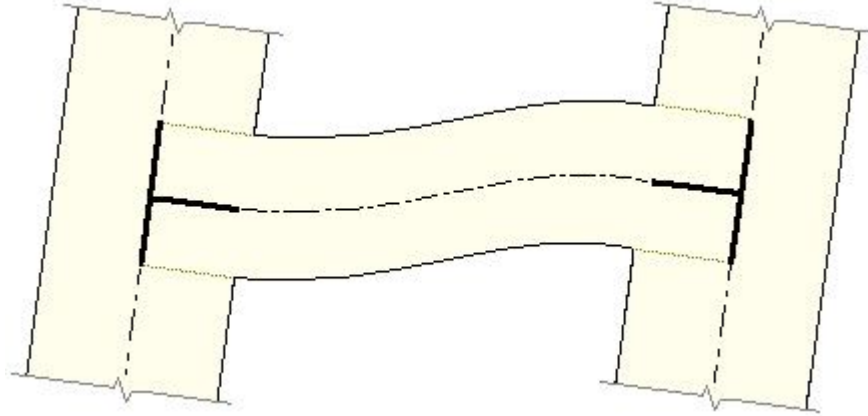
**Programda kullanılan standartlar :**

- 1 - TBDY 2018-Türkiye Bina Deprem Yönetmeliği
- 2 - Afet Bölgelerinde Yapılacak Yapılar Hakkında Yönetmelik (1975,1997,2007)
- 3 - TS-498 hareketli ve rüzgar yükü standardı.
- 4 - TS-500 betonarme yapıların hesap standardı.
- 5 - ACI-318, UBC-97 code
- 6 - EUROCODE-2,8 code
- 7 - SNIP-2.03.01 code

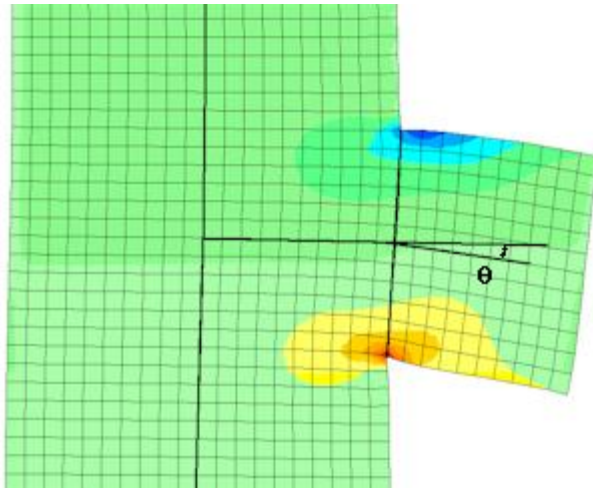


**PERDE ve KOLONLARDA EKSANTRISİTE**

STA4-CAD Perde ve kolonlarda eksenel yük kaçıklıklarını opsiyonel olarak dikkate alır. Geometrik akslar, elemanların bilgi tanımı içindir. Statik hesaplarda, elemanların ağırlık merkezlerini dikkate alarak gerçek eksenlerle çalışır. Perdelere zayıf yönünde saplanan kirişlerin, düşey plak gibi davranan perdedeki lokal eğilme deformasyonunu sonlu elemanlara eşdeğer yöntemle elastik ankastrelik değerlerine göre opsiyonel çözüm yapılabilir.

**KAYMA DEFORMASYONU ve RIJİTLİK BÖLGELERİ**

STA4-CAD Perde ve kolonlarda kayma deformasyonlarını rijitlik matrislerinde dikkate alır. Aynı şekilde rijit perdelerle bağlı kirişlerin kayma deformasyonlarında perdelerin genişlikleri oranında dikkate alarak rijitlik matrislerini oluşturur. Kirişlerin kolon kısmındaki bölgeleri, gerekse kolonların kiriş kısmındaki bölgeleri sonsuz rijit kabul edilerek moment alan teorisi ile sayısal integrasyon yapılarak gerçek rijit matrisi kurularak çözüm yapılır. Aynı şekilde kirişlerin yük matrisinde kolon kısmındaki bölgede sonsuz rijit davranışı dikkate alarak, ankastrelik tesirlerini bulur.



## DÖŞEME YÜK ANALİZİ

MARLEY KAPLAMA				
Kaplama (MARLEY )	0.050 t/m <sup>3</sup> ×	0.003 m	:	0.000
Kaplama harcı	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Tesviye betonu	2.000 t/m <sup>3</sup> ×	0.030 m	:	0.060
Sıva	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
TOPLAM.....				0.148

FAYANS KAPLAMA				
Kaplama (FAYANS )	2.200 t/m <sup>3</sup> ×	0.010 m	:	0.022
Kaplama harcı	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Tesviye betonu	2.000 t/m <sup>3</sup> ×	0.030 m	:	0.060
Sıva	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
TOPLAM.....				0.170

KARO KAPLAMA				
Kaplama (KARO MOZAİK )	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Kaplama harcı	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Tesviye betonu	2.000 t/m <sup>3</sup> ×	0.040 m	:	0.080
Sıva	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
TOPLAM.....				0.212

DUSUK DOSEME				
Kaplama (FAYANS )	2.200 t/m <sup>3</sup> ×	0.010 m	:	0.022
Kaplama harcı	2.200 t/m <sup>3</sup> ×	0.030 m	:	0.066
Tesviye betonu	2.000 t/m <sup>3</sup> ×	0.050 m	:	0.100
Sıva	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Dolgu	1.500 t/m <sup>3</sup> ×	0.200 m	:	0.300
TOPLAM.....				0.532

CATI DOSEMESI				
Kaplama (IZOLASYON )	0.100 t/m <sup>3</sup> ×	0.050 m	:	0.005
Tesviye betonu	2.000 t/m <sup>3</sup> ×	0.050 m	:	0.100
Sıva	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
TOPLAM.....				0.149

MERDIVEN				
Kaplama (MERMER )	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Kaplama harcı	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Sıva	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Dolgu	2.200 t/m <sup>3</sup> ×	0.100 m	:	0.220
TOPLAM.....				0.352

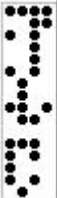
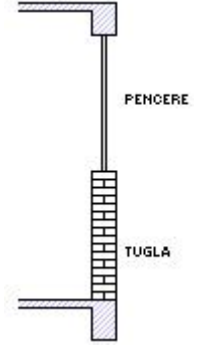
SAHANLIK				
Kaplama (MERMER )	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Kaplama harcı	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
Tesviye betonu	2.000 t/m <sup>3</sup> ×	0.030 m	:	0.060
Sıva	2.200 t/m <sup>3</sup> ×	0.020 m	:	0.044
TOPLAM.....				0.192

(Döşeme zatipleri, döşeme yük hesabında ilave edilecek)

## KIRIŞ YÜK ANALİZİ

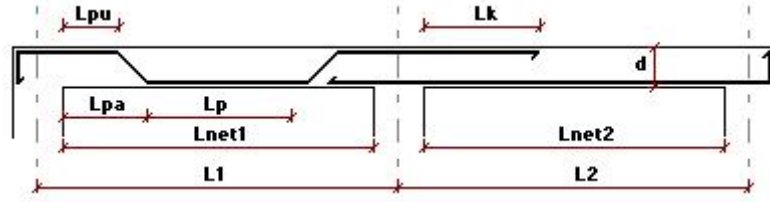
19cm Tugla Duvar yükü (19 cm )	0.320 t/m <sup>2</sup> × 2.500 m:	0.800
13cm Tugla Duvar yükü (13 cm )	0.250 t/m <sup>2</sup> × 2.500 m:	0.625
9cm Tugla Duvar yükü (9 cm )	0.200 t/m <sup>2</sup> × 2.500 m:	0.500
19cm Tug. pen Duvar yükü (19 cm )	0.320 t/m <sup>2</sup> × 1.000 m:	0.320
Pencere	0.050 t/m <sup>2</sup> × 1.500 m:	0.075
TOPLAM.....		0.395
13cm Tug. pen Duvar yükü (13 cm )	0.250 t/m <sup>2</sup> × 1.000 m:	0.250
Pencere	0.050 t/m <sup>2</sup> × 1.500 m:	0.075
TOPLAM.....		0.325
9cm Tug. pen. Duvar yükü (9 cm )	0.200 t/m <sup>2</sup> × 1.000 m:	0.200
Pencere	0.050 t/m <sup>2</sup> × 1.500 m:	0.075
TOPLAM.....		0.275
Cam Bolme Duvar yükü (2 cm )	0.050 t/m <sup>2</sup> × 2.700 m:	0.135
25cm Tugla Duvar yükü (25 cm )	0.380 t/m <sup>2</sup> × 2.500 m:	0.950
20cm GazBeton Duvar yükü (20 cm )	0.190 t/m <sup>2</sup> × 2.500 m:	0.475
15cm GazBeton Duvar yükü (15 cm )	0.160 t/m <sup>2</sup> × 2.500 m:	0.400
10cm GazBeton Duvar yükü (10 cm )	0.130 t/m <sup>2</sup> × 2.500 m:	0.325
20cm GazB.pen. Duvar yükü (20 cm )	0.190 t/m <sup>2</sup> × 1.000 m:	0.190
Pencere	0.050 t/m <sup>2</sup> × 1.500 m:	0.075
TOPLAM.....		0.265
15cm GazB.pen. Duvar yükü (15 cm )	0.160 t/m <sup>2</sup> × 1.000 m:	0.160
Pencere	0.050 t/m <sup>2</sup> × 1.500 m:	0.075
TOPLAM.....		0.235
10cm GazB.pen. Duvar yükü (10 cm )	0.130 t/m <sup>2</sup> × 1.000 m:	0.130
Pencere	0.050 t/m <sup>2</sup> × 1.500 m:	0.075
TOPLAM.....		0.205
Panel duvar Duvar yükü (5 cm )	0.050 t/m <sup>2</sup> × 2.700 m:	0.135
25cm GazBeton Duvar yükü (25 cm )	0.216 t/m <sup>2</sup> × 2.500 m:	0.540
10cm FabrikPan. Duvar yükü (10 cm )	0.130 t/m <sup>2</sup> × 2.500 m:	0.325
40cm Tas duvar Duvar yükü (40 cm )	1.098 t/m <sup>2</sup> × 1.000 m:	1.098

(Kiriş zati, Kiriş yük hesabında ilave edilecek)





## GENEL BETONARME CIZIM OPSİYONLARI

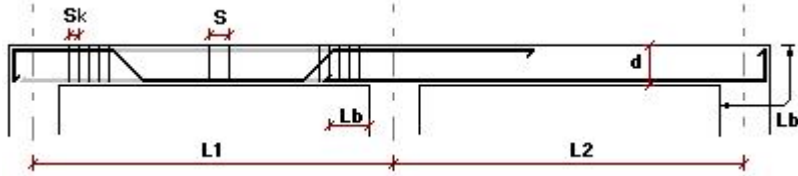


Maximum demir boyu.....cm.= 1200  
 Minimum demir bindirme boyu oranı.....=  $\emptyset \times 50$   
 min. Lp.....=  $L_{net1} / 2$   
 Lpa.....=  $L_{net1} / 5$   
 min. Lpu.....cm.= 30  
 min. Lpu .....=  $d / 2$   
 min. Lk .....=  $L_{net2} / 4$   
 Pilye kayma donatısı katılım oranı.....= 0  
 Genel kanca boyu .....=  $\emptyset \times 10$   
 Kiriş donatısının, kolon içindeki aderans boyu.....=  $\emptyset \times 50$   
 Kirişlerde sık etriye opsiyonu.....= gerekli  
 Kirişlerde Pilye opsiyonu.....= pilyesiz  
 Minimum pilye açıklık oranı.....=  $L_{net} / 2$   
 Tek donatılarda, pilye ve düz donatı tercihi.....= düz  
 Kirişlerde minimum iki demir aralığı.....cm.= 2.5

## DOSEME BETONARME OPSİYONLARI

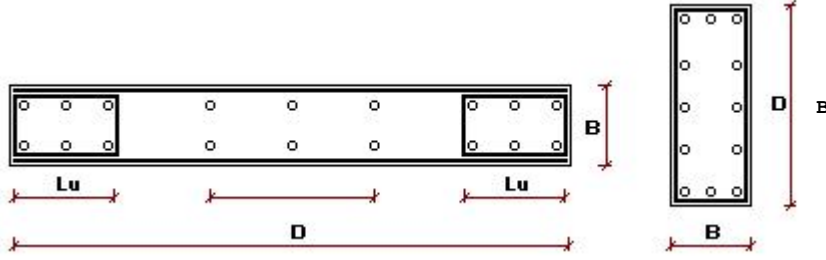
Plaklarda paspayı.....cm.= 2.5  
 Maksimum demir aralığı.....cm.= 20,  $d \times 1.5$   
 İki yonlu plak-minimum çekme bölgesi pürsantajı = 0.002  
 Tek yonlu plak-minimum çekme bölgesi pürsantajı = 0.003  
 Nervur Max. Etriye aralığı.....cm.= 20,  $d / 2$   
 Lk : üst donatı uzatma boyu.....cm.=  $50\emptyset, L_n / 4$

## KIRIS BETONARME OPSİYONLARI



Etriye paspayı / Boyuna donatı paspayı .....cm.= 3.5 / 5  
 Maksimum sehım sınırı (bölme duvarsız) .....=  $L / 360$   
 Maksimum sehım sınırı (bölme duvarlı) .....=  $L / 240$   
 Min. çekme bölgesi TS500-2000 'e göre .....= 0.003  
 As min=  $0.8 \times f_{ctd} / f_{yd}$  alınacaktır.  
 Minimum düz ve pilye donatı çapı ..... $\emptyset$ . = 16  
 Minimum montaj donatı çapı ..... $\emptyset$ . = 14  
 Minimum gövde donatı çapı ..... $\emptyset$ . = 14  
 Minimum etriye donatı çapı ..... $\emptyset$ . = 10  
 Pilye açısı..... $^\circ$ . = 45  
 Minimum gövde demirsiz kiriş yüksekliği.....cm.= 59  
 Minimum düz ve montaj demir aralığı .....cm.= 20  
 Kayma donatısı beton katılım oranı.....= .8  
 Süreklilik için max. kolon genişliği.....cm.= 200  
 Minimum montaj donatı oranı .....(% maxAs). = .25  
 Maksimum etriye aralığı..S.....cm.= 20  
 Minimum etriye aralığı..S.....cm.= 10  
 Maksimum etriye aralığı. Sk.(1).....cm.= 15  
 Maksimum etriye aralığı. Sk.(2).....=  $d / 4$   
 Maksimum etriye aralığı. Sk.(3).....=  $\emptyset \times 8$   
 Maksimum tek etriye genişliği .....cm.= 40  
 min.(alt As/üst As) .....= .5  
 min.üst As= .....=  $0.8 \times f_{ctd} / f_{yd}$   
 min Lb =.....=  $\emptyset \times 50$   
 Alt ilaveye, düz donatıları L/4 uzatarak katılımı.....= Hayır  
 Üst ilaveye, montaj donatı. L/4 uzatarak katılımı.....= Hayır

## KOLON-PERDE BETONARME OPSİYONLARI



KOLON ve PERDELERİN betonarme opsiyonlari :

Etriye paspayı / Boyuna donatı paspayı .....cm.= 4 / 5.5

Min.kolon çekme bölgesi.....= .002

Min.kolon toplam kesit .....= .01

Kolon eksenel yük eksantirisite etkisinin alınması..= evet

Minimum etriye aralığı.....cm.= 10

Maximum etriye aralığı.(1).....cm.= 20

Maximum etriye aralığı (2).....min.=  $\emptyset \times 15$

Minimum çiroz aralığı.....min.=  $\emptyset \times 40$

Minimum donatı çapı .....= 16

Minimum etriye çapı .....= 10

Perde/Kolon oranı (D/B).....= 5

Perde uzun etriyelerinde gönye.....= Gönyeli

Nervürlü etriye kanca açısı..... (90°,135°)= 135

min.Hcr yüksekliği .....< D x 2

max.Hcr yüksekliği .....>= D x 1

max.Hcr yüksekliği .....>= Hw/6

Min.başlık bölgesi.(Hcr).....= .001

Min.başlık bölgesi.....= .001

Min.gövde bölgesi.....= .0025

Min.başlık bölgesi.....Lu= 20 cm

Min.başlık bölgesi.(Hcr).....Lu=B x 1

Min.başlık bölgesi.(Hcr).....Lu=D x .1

Min.başlık bölgesi.....Lu=B x 1

Min.başlık bölgesi.....Lu=D x .1

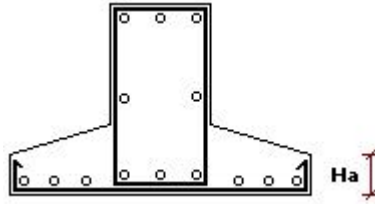
Başlık bölgesi min. donatı çapı ..... $\emptyset$ ..= 14

Gövde bölgesi min. donatı çapı ..... $\emptyset$ ..= 12

Perdelerde tasarım eğilme momenti.....= Evet

Kolonlarda minimum iki demir aralığı.....cm.= 4.0

## TEMEL BETONARME OPSİYONLARI



Etriye paspayı / Boyuna donatı paspayı .....cm.= 3.5 / 5

Min. çekme bölgesi TS500-2000 (As min=0,8.fctd/fyd).= 0.003

Min. toplam kesit .....= .005

Minimum basınç bölgesi donatı oranı .....= .333

Pilye açısı.....= 60

Minimum etriye aralığı.....cm.= 10

Maximum etriye aralığı.....cm.= 20

Maximum etriye genişliği.....cm.= 60

Minimum düz ve montaj demir aralığı .....cm.= 20

Temelde, Kolon donatı filiz boyu.....cm.= 50

Müt. temel min. etriye çapı..... $\emptyset$ ..= 8

Müt. temel min. düz ve pilye çapı..... $\emptyset$ ..= 12

Müt. temel min. montaj çapı..... $\emptyset$ ..= 12

Müt. temel min. gövde çapı..... $\emptyset$ ..= 12

Temel min. ampatman çapı..... $\emptyset$ ..= 12

Ampatman kenar yüksekliği.(Ha).....cm.= 20

## STA4-CAD PROGRAMI

ÇOK KATLI BETONARME YAPILARIN STATİK ve BETONARME ANALİZ PROGRAMI Ver.14.1 Rev.(29.8.2025)

PROJE İSMİ.....: YANGIN MERDİVENİ  
 KAT ADEDİ.....: 2  
 Bir kattaki KOLON SAYISI.....: 6  
 X yönü aks sayısı.....: 9  
 Y yönü aks sayısı.....: 9  
 DEPREM YER HAREKETİ DÜZEYİ.....: DD2 50 yılda aşılma olasılığı %10  
 ZEMİN SINIFI.....: ZD  
 BİNA KOORDİNATI..... (ENLEM/BOYLAM) : 40.75738° / 30.37308°  
 YEREL SPECTRAL İVME KATSAYISI..... S<sub>s</sub>/S<sub>1</sub> : 1.653 / 0.452  
 YAPI DAVRANIŞ KATSAYISI..... R : 8.00  
 SİSTEM DAYANIM FAZLALIĞI KATSAYISI..... D : 3  
 SPEKTRUM KAREKTERİSTİK PERYODU..... (T<sub>a</sub>/T<sub>b</sub>) : 0.101 / 0.505  
 HAREKETLİ YÜK KATSAYISI..... (n) : 0.3  
 SIFIR RÖLATİF HAREKET YÜKSEKLİĞİ..... (m) : 0.00  
 HAREKETLİ YÜK AZALTMA KATSAYISI..... (C<sub>z</sub>) : 0.0  
 ZEMİN TAŞIMA GÜCÜ TASARIM GERİLMESİ. (t/m<sup>2</sup>) : 15.0  
 ZEMİN YATAK KATSAYISI..... (t/m<sup>3</sup>) : 840.0  
 BETON YOĞUNLUĞU..... (t/m<sup>3</sup>) : 2.5  
 GENLEŞME ISI FARKI..... (°C) : 0.0  
 STATİK ANALİZ YÖNTEMİ .....: FEA3D LINEER ANALİZ / Birim Mesh Genisliği 1m  
 DEPREM STANDARDI .....: TBDY2018 CODE  
 BETONARME HESAP YÖNTEMİ .....: TAŞIMA GÜCÜ YÖNTEMİ TS500-2000  
 BETONARME KESİT DONATI HESAP YÖNTEMİ .....: BRÜT KESİTE GÖRE  
 DEPREM HESABI YÖNTEMİ .....: MOD SÜPERPOZİSYONU İLE MODAL ANALİZ  
 TEMEL ANALİZ OPSİYONU.....: TEMELLER DİKKATE ALINMADAN, YAPI ANALİZİ  
 Zemin gerilmesi hareketli yük azaltma değeri.: 1.00  
 Kolonun oturduğu kiriş tesir çarpanı.....: Düşey deprem analizi yapılmıştır.  
 Kiriş & Kolon rijitlik bölgesi opsiyonu.....: Yarı Sonsuz Rijit davranış  
 Kiriş uçlarında elastik ankastrelik opsiyonu : Elastik ankastre

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## ÇATLAMIŞ KESİT ETKİN KESİT RİJİTLİĞİ BİLGİLERİ

Elemanlar	Eğilme	Eksenel	Lokal X kesme	Lokal Y kesme
Perde	0.25	0.50	0.50	1.00
Bodrum perdesi	0.50	0.80	0.50	1.00
Döşeme	0.25	0.25	0.25	1.00
Çerçeve kirişi	0.35	1.00	1.00	1.00
Çerçeve kolonu	0.70	1.00	1.00	1.00
Bağ kirişi	0.15	1.00	1.00	1.00
Perde çubuk	0.50	1.00	0.50	0.50

## BETON ve ÇELİK MALZEME BİLGİLERİ

(kg/cm<sup>2</sup>)

Yapı Elemanı	Malzeme	Elastisite Modülü E	G	Beton dayanım gerilmesi	Çelik akma (Genel)	gerilmesi (Etriye)	Birim Ağırlık t/m <sup>3</sup>
Plak/Nervür	E1	C35	332000	132800	350	4200	2.50
HNP	C35	332000	132800	350	5000	5000	2.50
Temel	E1	C35	332000	132800	350	4200	2.50
Kiriş\Kolon	E1	C35	332000	132800	350	4200	2.50

HNP : Hazır Nervürlü Plak

TAŞIMA GÜCÜ MALZEME KATSAYILARI	BETON 1.50	ÇELİK 1.15
TAŞIMA GÜCÜ YÜK KATSAYILARI	SABİT YÜK 1.40	HAREKETLİ YÜK 1.60

## BETONARME HESAP YÜK KOMBİNASYONU

Ölü yük Cg	Hareketli yük Cq	Zemin Cs	Deprem ± Ce	Rüzgar ± Cw	Isı Ct
1.40	1.60	0.00	0.00	0.00	0.00
1.40	1.60	1.60	0.00	0.00	0.00
1.00	1.20	0.00	0.00	0.00	1.20
1.00	1.00	0.00	1.00	0.00	0.00
1.00	1.00	1.00	1.00	0.00	0.00
0.90	0.00	0.00	1.00	0.00	0.00
1.00	1.30	0.00	0.00	1.30	0.00
1.00	1.30	1.00	0.00	1.30	0.00
0.90	0.00	0.00	0.00	1.30	0.00
0.90	0.00	0.90	0.00	1.30	0.00

TBDY2018 Düşey Deprem Kombinasyonu : G + Q + 0.2 S + Edh + 0.3 Edz, 0.9 G + H + Edh - 0.3 Edz  
CODE:TS500T.COD

ZEMİN GERİLMESİ YÜK KOMBİNASYONU  $q_0 < q_t$ 

ZEMİN GERİLMESİ OPSİYONU:ZEMİN TAŞIMA GÜCÜ TASARIM GERİLMESİ

Ölü yük Cg	Hareketli yük Cq	Zemin Cs	Deprem ± Ce	Rüzgar ± Cw	Isı Ct
1.40	1.60	0.00	0.00	0.00	0.00
1.40	1.60	1.60	0.00	0.00	0.00
1.00	1.20	0.00	0.00	0.00	1.20
1.00	1.00	0.00	1.00	0.00	0.00
1.00	1.00	1.00	1.00	0.00	0.00
0.90	0.00	0.00	1.00	0.00	0.00
1.00	1.30	0.00	0.00	1.30	0.00
1.00	1.30	1.00	0.00	1.30	0.00
0.90	0.00	0.00	0.00	1.30	0.00
0.90	0.00	0.90	0.00	1.30	0.00

## DUVAR MALZEME BİLGİLERİ

Malzeme no	E (kg/cm <sup>2</sup> )	fbd (kg/cm <sup>2</sup> )	fbtd (kg/cm <sup>2</sup> )
B1	10000	10.00	1.00
B2	18000	12.00	1.50
B3	302500	250.0	2.00
B4	20000	30.00	3.00
B5	30000	30.00	3.00

## RÜZGAR YÜKÜ VE KATSAYILARI

RÜZGAR YÜKÜ BASINÇ KATSAYISI : 0.8

RÜZGAR YÜKÜ EMME KATSAYISI : 0.4

Yükseklik bölgesi	H	Qw
1. bölge	8.00	0.05
2. bölge	20.00	0.08
3. bölge	100.00	0.11
4. bölge	200.00	0.13

## YAPI AKS BİLGİLERİ

X yönü aks bilgileri

no	isim	Ax	Bx
1	1''	0.00	0.00
2	1'	0.00	3.60
3	3	0.00	1.90
4	4	0.00	1.70
5	5	0.00	-1.00
6		0.00	3.70
7		0.00	-0.10
8		0.00	-0.50
9		0.00	-0.60

Y yönü aks bilgileri

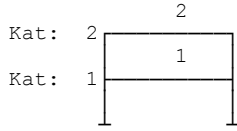
no	isim	Ay	By
1	T	0.00	0.00
2	T1	0.00	2.35
3	V	0.00	8.00
4	V	0.00	2.15
5		0.00	6.35
6		0.00	3.35
7		0.00	-0.35
8		0.00	-0.85
9		0.00	8.50

## 1. KAT KOLONLARI AKS BİLGİLERİ

Kolon no	X aksı	Y aksı	dx	dy	alt yük.
101	1X	1Y	-10.0	-35.0	0.00
103	1X	4Y	-10.0	-30.0	0.00
105	1X	3Y	-10.0	0.1	0.00

Kolon no	X aksı	Y aksı	dx	dy	alt yük.
102	2X	1Y	10.0	-35.0	0.00
104	2X	4Y	10.0	-30.0	0.00
106	2X	3Y	10.0	0.1	0.00

## KAT DIYAFRAMLARI



## DEPREM RAPORU

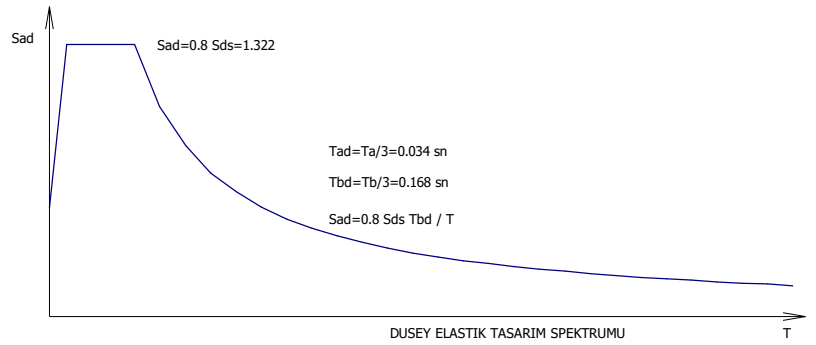
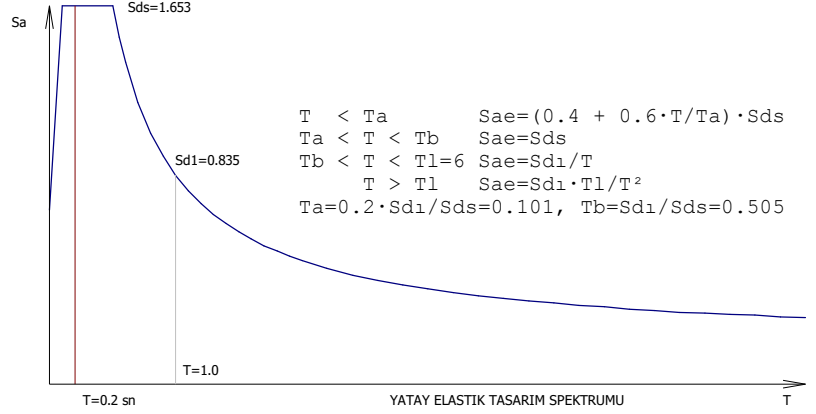
DEPREM STANDARDI : TBDY2018 CODE  
 DEPREM ANALİZİ : MOD SÜPERPOZİSYONU İLE MODAL ANALİZ  
 DEPREM YER HAREKETİ DÜZEYİ : DD2 50 yılda aşılma olasılığı %10  
 ZEMİN SINIFI : ZD  
 BİNA KOORDİNATI (ENLEM/BOYLAM) : 40.75738° / 30.37308°  
 YEREL SPECTRAL İVME KATSAYISI  $S_s/S_1$  : 1.653 / 0.452  
 TASARIM SPECTRAL İVME KATSAYISI  $S_{ds}/S_{d1}$  : 1.653 / 0.835 DD2, 0.837 / 0.363 DD3  
 YAPI DAVRANIŞ KATSAYISI  $R$  : 8.00 TÜMÜ YS. ÇERÇEVELİ YAPILAR - A11  
 SİSTEM DAYANIM FAZLALIĞI KATSAYISI  $D$  : 3  
 DEPREM TASARIM SINIFI DTS : 1a  
 BİNA YÜKSEKLİK SINIFI BYS : 7  $H_n=7.44m$   
 BİNA KULLANIM SINIFI BKS : 1  $I = 1.5$   
 Modal Analiz min. deprem yükü oranı  $\beta$  : 0.9  
 Deprem yükü eksantirisitesi : 0.050  
 Deprem modal analiz CQC sönüm oranı : %5  
 PERFORMANS HEDEFLERİ :  
 DD2 } Normal Performans Hedefi : KH (Kontrollü Hasar)  
 Değerlendirme/Tasarım : DGT (Dayanıma Göre Tasarım)

DİYAFRAM SAYISI : 2  
 Diyafram tanımı : KAT(diyafram no)

## DİNAMİK ANALİZ BİLGİLERİ

TASARIM SPECTURUM BİLGİSİ (TBDY 2018 SPEKTRUM)

T (s)	Sa
0.00	0.661
0.10	1.653
0.51	1.653
0.56	1.504
0.61	1.380
0.71	1.184
0.81	1.037
0.91	0.923
1.01	0.831
1.11	0.756
1.21	0.693
1.31	0.640
1.41	0.594
1.51	0.555
1.61	0.520
1.71	0.490
1.81	0.463
1.91	0.438
2.01	0.416
2.21	0.379
2.41	0.347
2.61	0.321
2.81	0.298
3.01	0.278
3.21	0.261
3.41	0.245
3.61	0.232
3.81	0.219
4.01	0.208
4.21	0.199
4.41	0.190
4.61	0.181
4.81	0.174
5.01	0.167
5.21	0.160
5.41	0.154
5.61	0.149
5.81	0.144
6.01	0.139

Düsey deprem etkisi hesabında tüm taşıyıcı sistemler için  $R/I = 1$  ve  $D = 1$  alınacaktır.

$$R_a(T)_x = 3.937 \quad R_a(T)_y = 3.515 \quad T < T_b \Rightarrow R_a(T) = D + (R / I - D) \cdot T / T_b$$

## MODAL ANALİZ - YAPI PERİYOD ve VEKTORLERİ

Fea Mod sayısı=27 Fea nokta sayısı=198

Mod	1.mod	2.mod	3.mod	4.mod	5.mod	6.mod	7.mod	8.mod	9.mod
$\omega$	30.97	39.73	56.35	91.15	119.25	156.80	163.29	200.41	299.59
T	0.2029	0.1581	0.1115	0.0689	0.0527	0.0401	0.0385	0.0314	0.0210
Mxr%	76.025	9.158	0.024	4.061	2.018	0.007	0.025	0.158	0.000
Myr%	1.169	6.252	76.154	0.011	0.208	2.181	4.393	0.123	0.002

Mod $\omega$ T	10.mod 323.40 0.0194	11.mod 333.43 0.0188	12.mod 371.58 0.0169	13.mod 506.80 0.0124	14.mod 523.26 0.0120	15.mod 566.05 0.0111	16.mod 597.32 0.0105	17.mod 669.31 0.0094	18.mod 709.45 0.0089
Mxr%	0.005	0.000	0.019	0.000	0.000	0.000	0.000	0.000	0.000
Myr%	0.794	0.028	0.188	0.000	0.000	0.000	0.000	0.000	0.000

Mod $\omega$ T	19.mod 778.90 0.0081	20.mod 807.85 0.0078	21.mod 1243.17 0.0051	22.mod 1713.50 0.0037	23.mod 4977.33 0.0013	24.mod 8392.08 0.0007	25.mod 17179.69 0.0004	26.mod 612488.9 0.0000	27.mod 1447497. 0.0000
Mxr%	0.000	0.000	0.000	0.002	0.026	0.000	3.793	0.013	0.003
Myr%	0.000	0.000	0.000	0.000	0.024	0.001	3.790	0.012	0.000

Mod $\omega$ T	
Mxr%	$\Sigma = 95.34$
Myr%	$\Sigma = 95.33$

$M_r = \Sigma (m_i \cdot \phi_{xir}^2 + m_i \cdot \phi_{yir}^2 + m_{\theta i} \cdot \phi_{\theta ir}^2)$   
 $M_{xr} = \Sigma [(\Sigma m \cdot \phi)^2 / M_r] = 95.34 > 95.00$  Dinamik kütle oranı yeterli.  
 $M_{yr} = \Sigma [(\Sigma m \cdot \phi)^2 / M_r] = 95.33 > 95.00$  Dinamik kütle oranı yeterli.

## EŞDEĞER DEPREM HESABI 1. DOĞAL TİTREŞİM PERİYODUNUN KONTROLÜ

Hn=7.44m Ctx=0.1 Cty=0.1

$T_{lx} = C_{tx} \cdot H_n^{3/4} = 0.450 \text{ s.}, T_x = 0.203 \text{ s.} < 1.4 \times 0.45 \text{ s.} >> T_{x1} = 0.203 \text{ s.}$

$T_{ly} = C_{ty} \cdot H_n^{3/4} = 0.450 \text{ s.}, T_y = 0.112 \text{ s.} < 1.4 \times 0.45 \text{ s.} >> T_{y1} = 0.112 \text{ s.}$

## KAT KÜTLESİ ve RİJİTLİK MERKEZİ (t)

Kat (dyf)	H (m)	Wg	Wq	n	R Rx/Ry	D Dx/Dy	$\Sigma W_k$
2	7.44	45.25	14.83	0.30	8	3	49.701
1	4.02	46.36	14.83	0.30	8	3	50.805

$\Sigma W_t = 100.506$

EŞDEĞER DEPREM FORMÜLÜ  $F_{di} = (V_t - F_t) \frac{W_i \cdot H_i}{\Sigma W_i \cdot H_i}$

## DEPREM KUVVETİ (t)

Deprem tepe yükü  $F_{tx} = 0.63$   $F_{ty} = 0.71$  (t)

X YÖNÜ

Y YÖNÜ

Kat no	Modal Analiz	Eşdeğer dep.yön.	Deprem yükü	Kat tipi	Modal Analiz	Eşdeğer dep.yön.	Deprem yükü	Kat tipi
2	23.041	27.409	24.301	UST KAT	24.874	30.699	28.003	UST KAT
1	12.968	14.789	13.677	NORMAL	12.910	16.564	14.534	NORMAL
$\Sigma$	36.009	42.198	37.978	GENEL	37.784	47.264	42.537	GENEL

Fea3d analizde ek dışmerkezlik etkisi;  $\Delta m_i = m_i \cdot e^2$  kütle artımı ile düzenlenmiştir.

$V_{tx} = 42.20 > 0.04 \cdot I \cdot S_{ds} \cdot W = 9.97$  TBDY2018 4.7.1.1

$V_{ty} = 47.26 > 0.04 \cdot I \cdot S_{ds} \cdot W = 9.97$

X Deprem kontrol:  $0.90 \times 42.198 = 37.978 > 36.009 >>> 37.978$

Y Deprem kontrol:  $0.90 \times 47.264 = 42.537 > 37.784 >>> 42.537$

## YAPI DEPREM YÜKLERİ (t)

Yapı periyodları  $T_x = 0.203$   $T_y = 0.112$   $R = 8.0$

$T_x < T_b >> R_{ax} = D + (R / I - D) T_x / T_b = 3.94$   $T_y < T_b >> R_{ay} = D + (R / I - D) T_y / T_b = 3.52$

X yönü  $W = 100.51$   $F_{deprem} = 42.20$  tepe yükü  $F_d = 0.63$

Y yönü  $W = 100.51$   $F_{deprem} = 47.26$  tepe yükü  $F_d = 0.71$

Kat (Dyf)	F modal X	F eşdeğer X	F deprem X	F modal Y	F eşdeğer Y	F deprem Y
2 ( 2)	23.04	27.41	24.30	24.87	30.70	28.00
1 ( 1)	12.97	14.79	13.68	12.91	16.56	14.53
$\Sigma$	36.01	42.20	37.98	37.78	47.26	42.54

X Deprem kontrol:  $0.90 \times 42.198 = 37.978 > 36.009 >>> 37.978$

Y Deprem kontrol:  $0.90 \times 47.264 = 42.537 > 37.784 >>> 42.537$

## Rüzgar kuvvetleri (t)

Kat (dyf)	X-yönü F	X-yönü ey m	Y-yönü F	Y-yönü ex m
2	1.642	1.800	0.739	4.000
1	1.930	1.800	0.868	4.000

Yapıda Deprem Perdesi bulunmadı.

Deprem perde taban devrilme oranı Mdev/Mo= 0.00

Bina Taşıyıcı Sistem seçimi : Süneklilik düzeyi Yüksek taşıyıcı sistem

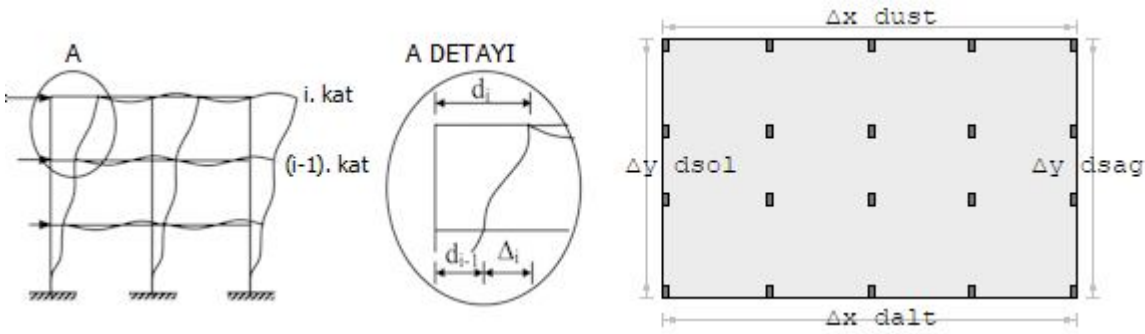
Hn= 7.44m &gt;&gt; BYS=7

TBDY2018 4.3.4.3 koşulu sağlanmaktadır. BYS=7 ≥ 3 ✓

Kenar aks perdesi bulunmamıştır.

Boşluklu perde bulunmamıştır

## DEPREMDE YAPI DÜZENSİZLİKLERİNİN KONTROLÜ



## A1,B2 düzensizliklerinin kontrolü

 $d_i = R/I \cdot \Delta$ ,  $K=1$ ,  $T_x=0.203s$ ,  $T_y=0.112s$  $\lambda_x = S_a(T_x, DD3) / S_a(T_x, DD2) = 0.837 / 1.653 = 0.507$  $\lambda_y = S_a(T_y, DD3) / S_a(T_y, DD2) = 0.837 / 1.653 = 0.507$  $\lambda_x \cdot X \max(d_i/h_i) \leq 0.008 \cdot K = 0.008$   $\lambda_y \cdot Y \max(d_i/h_i) \leq 0.008 \cdot K = 0.008$  $Ch=0.5$ ,  $D=3.00$ ,  $R=8.00$  $\theta_{pi} = [ort(\Delta_i) \cdot \sum w_k] / (V_i \cdot h_i) \leq 0.12 \cdot D / (Ch \cdot R) \Rightarrow \max \theta_{pi} = 0.090$ 

## X YÖNÜ (+)

Kat	$\Delta X$ düst (m)		$\Delta X$ dalt (m)		$\Delta X$ ort	nbi	nki	$\lambda \cdot R / I \cdot \Delta x / h$	$\theta_i$	kat tipi
2	0.0017608»	S201	0.0023950»	S205	0.0020779	1.15	0.00	0.00189 ✓	0.00107 ✓	Üst kat
1	0.0031629»	S102	0.0021250»	S106	0.0026440	1.20	1.08	0.00213 ✓	0.00162 ✓	Normal kat

## X YÖNÜ (-)

Kat	$\Delta X$ düst (m)		$\Delta X$ dalt (m)		$\Delta X$ ort	nbi	nki	$\lambda \cdot R / I \cdot \Delta x / h$	$\theta_i$	kat tipi
2	0.0020887»	S201	0.0019599»	S205	0.0020243	1.03	0.00	0.00165 ✓	0.00104 ✓	Üst kat
1	0.0037016»	S102	0.0016967»	S106	0.0026991	1.37	1.13	0.00249 ✓	0.00165 ✓	Normal kat

## Y YÖNÜ (+)

Kat	$\Delta Y$ düst (m)		$\Delta Y$ dalt (m)		$\Delta Y$ ort	nbi	nki	$\lambda \cdot R / I \cdot \Delta y / h$	$\theta_i$	kat tipi
2	0.0008168»	S205	0.0012110»	S206	0.0010139	1.19	0.00	0.00096 ✓	0.00045 ✓	Üst kat
1	0.0010070»	S101	0.0014172»	S102	0.0012121	1.17	1.02	0.00095 ✓	0.00066 ✓	Normal kat

## Y YÖNÜ (-)

Kat	$\Delta Y$ düst (m)		$\Delta Y$ dalt (m)		$\Delta Y$ ort	nbi	nki	$\lambda \cdot R / I \cdot \Delta y / h$	$\theta_i$	kat tipi
2	0.0008709»	S205	0.0010631»	S206	0.0009670	1.10	0.00	0.00084 ✓	0.00043 ✓	Üst kat
1	0.0010892»	S101	0.0012371»	S102	0.0011632	1.06	1.02	0.00083 ✓	0.00064 ✓	Normal kat



TBDY2018-4.9.3.1 Maksimum Deprem deplasmanı ve minimum deprem derzi (mm)  
 $\alpha = 0.5$  (R/I) = 2.667

Kat	Hi (m)	uiX	uiY	min. diX	min. diY
2	7.440	4.5	1.9	40.0	40.0
1	4.020	2.4	0.9	30.0	30.0

Hi ≤ 6m min.di=30mm  
Hi > 6m min.di=30+10·[(Hi-6)/3] mm

TBDY 3.6.2.1 A1 burulma düzensizliği:

1.2 < nbi=1.371 < 2 , modal analizle çözülmüştür ✓

TBDY 3.6.2.1 B2 düzensizliği sağlanmaktadır. ✓

TBDY 4.9.1.3 kosulu sağlanmaktadır. Xmax(di/hi) = 0.0025 < 0.008 ✓ Ymax(di/hi) = 0.001 < 0.008 ✓

TBDY 4.36 koşulu sağlanmaktadır. max θi=0.002 < 0.090 ✓

#### B1-Düşey doğrultudaki düzensizliklerinin kontrolü

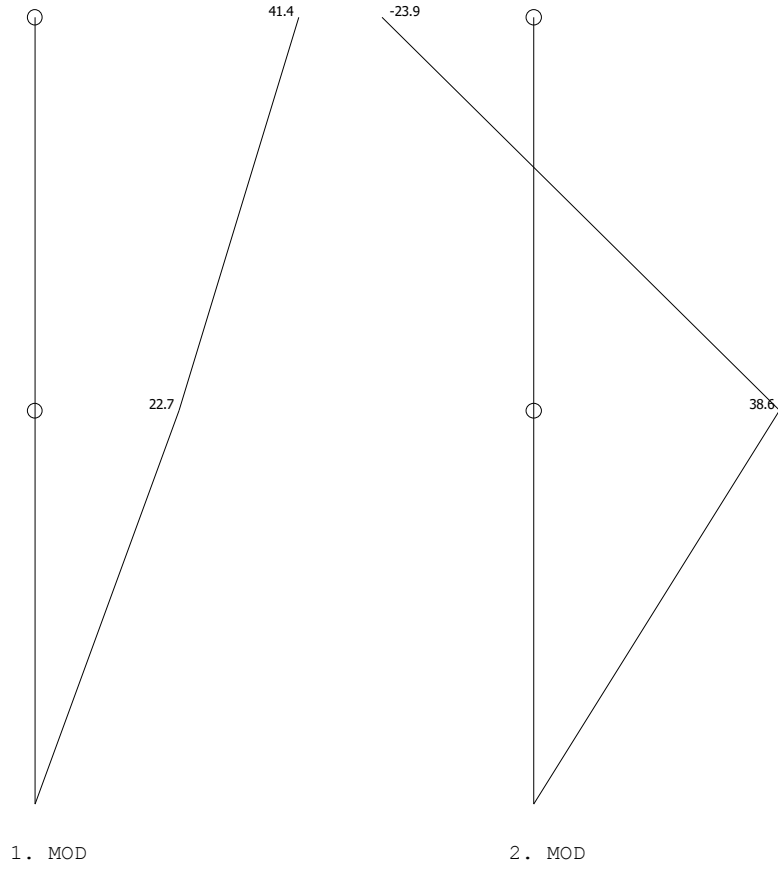
Kat	Aw	Agx	Agy	Akx	Aky	Σ Aex	Σ Aey	ncix	nciy	AÇIKLAMA
2	1.68	0.00	0.00	0.00	0.00	1.68	1.68	1.00	1.00	üst kat ✓
1	1.68	0.00	0.00	0.00	0.00	1.68	1.68	1.00	1.00	Düzenli ✓

Ba=Bax+0.3×Bay, Ba=0.3×Bax+Bay :

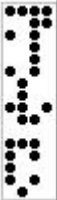
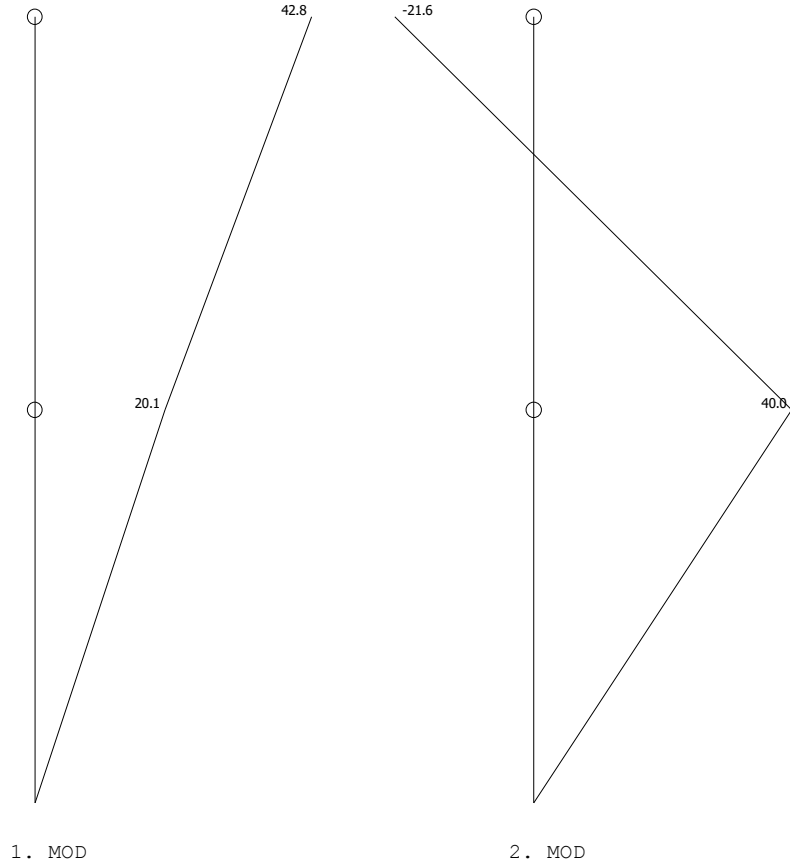
Kirişlerde, Kolonlarda; (Ba=Bax+0.3×Bay, Ba=0.3×Bax+Bay) düzeltmesi yapılmıştır.

## MODAL ANALİZ MOD GRAFİĞİ (1000 x Dep. vektörü)

X yönü



Y yönü



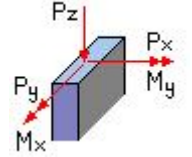
## KİRİŞ DÜŞEY YÜK BİLGİLERİ

Kiriş no	A1 m	A2 m	G1 t/m	G2 t/m	Q1 t/m	Q2 t/m	Yük elemanı no
K101	0.20	0.85	0.18	0.78	0.13	0.55	D101
K101	1.05	1.30	0.78	0.78	0.55	0.55	D101
K101	2.35	0.85	0.78	0.18	0.55	0.13	D101
K102	0.20	0.85	0.18	0.78	0.13	0.55	D101
K102	1.05	1.30	0.78	0.78	0.55	0.55	D101
K102	2.35	0.85	0.78	0.18	0.55	0.13	D101
K102	1.80	1.40	1.11	1.11	0.65	0.65	D103
K102	0.20	1.40	2.53	2.53	1.49	1.49	D202
K103	0.20	1.50	0.91	0.91	0.64	0.64	D102
K103	0.20	3.00	1.03	1.03	0.73	0.73	D105
K105	0.35	0.60	0.36	0.78	0.25	0.55	D101
K105	0.95	0.90	0.78	0.14	0.55	0.10	D101
K106	1.15	3.00	1.17	1.17	0.83	0.83	D104
K107	0.35	0.60	0.36	0.78	0.25	0.55	D101
K107	0.95	0.90	0.78	0.14	0.55	0.10	D101
K201	0.20	0.85	0.18	0.78	0.13	0.55	D201
K201	1.05	1.30	0.78	0.78	0.55	0.55	D201
K201	2.35	0.85	0.78	0.18	0.55	0.13	D201
K202	0.20	0.85	0.18	0.78	0.13	0.55	D201
K202	1.05	1.30	0.78	0.78	0.55	0.55	D201
K202	2.35	0.85	0.78	0.18	0.55	0.13	D201
K202	1.80	1.40	1.11	1.11	0.65	0.65	D203
K203	0.20	1.50	0.91	0.91	0.64	0.64	D202
K203	0.20	3.00	1.03	1.03	0.73	0.73	D205
K205	0.35	0.60	0.36	0.78	0.25	0.55	D201
K205	0.95	0.90	0.78	0.14	0.55	0.10	D201
K206	1.15	3.00	1.17	1.17	0.83	0.83	D204
K207	0.35	0.60	0.36	0.78	0.25	0.55	D201
K207	0.95	0.90	0.78	0.14	0.55	0.10	D201



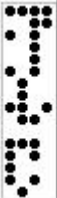
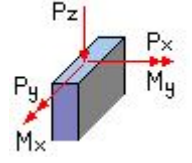
## KOLON YÜK BİLGİLERİ

Kolon no	Kombinasyon	Px t	Py t	Pz t	Mx tm	My tm	Eleman no
S101	Olu yük	0.00	0.00	0.09	0.01	-0.02	D101
S101	Hareketli yük	0.00	0.00	0.06	0.01	-0.02	D101
S101	Olu yük	0.00	0.00	0.02	0.00	0.00	D101
S101	Hareketli yük	0.00	0.00	0.02	0.00	0.00	D101
S102	Olu yük	0.00	0.00	0.09	-0.01	-0.02	D101
S102	Hareketli yük	0.00	0.00	0.06	-0.01	-0.02	D101
S102	Olu yük	0.00	0.00	0.02	0.00	0.00	D101
S102	Hareketli yük	0.00	0.00	0.02	0.00	0.00	D101
S103	Olu yük	0.00	0.00	0.04	0.00	0.00	D102
S103	Hareketli yük	0.00	0.00	0.02	0.00	0.00	D102
S103	Olu yük	0.00	0.00	0.02	0.00	0.00	D101
S103	Hareketli yük	0.00	0.00	0.02	0.00	0.00	D101
S103	Olu yük	0.00	0.00	0.01	0.00	0.00	D101
S103	Hareketli yük	0.00	0.00	0.01	0.00	0.00	D101
S103	Olu yük	0.00	0.00	0.35	-0.07	0.02	D102 Duvar
S104	Olu yük	0.00	0.00	0.02	0.00	0.00	D101
S104	Hareketli yük	0.00	0.00	0.02	0.00	0.00	D101
S104	Olu yük	0.00	0.00	0.01	0.00	0.00	D101
S104	Hareketli yük	0.00	0.00	0.01	0.00	0.00	D101
S104	Olu yük	0.00	0.00	0.28	0.02	0.01	D103
S104	Hareketli yük	0.00	0.00	0.16	0.01	0.01	D103
S105	Olu yük	0.00	0.00	0.26	-0.01	-0.09	D105
S105	Hareketli yük	0.00	0.00	0.18	0.00	-0.06	D105
S105	Olu yük	0.00	0.00	0.18	-0.01	-0.06	D102
S105	Hareketli yük	0.00	0.00	0.13	-0.01	-0.04	D102
S106	Olu yük	0.00	0.00	0.26	0.03	-0.09	D105
S106	Hareketli yük	0.00	0.00	0.18	0.02	-0.06	D105
S201	Olu yük	0.00	0.00	0.09	0.01	-0.02	D201
S201	Hareketli yük	0.00	0.00	0.06	0.01	-0.02	D201
S201	Olu yük	0.00	0.00	0.02	0.00	0.00	D201
S201	Hareketli yük	0.00	0.00	0.02	0.00	0.00	D201
S202	Olu yük	0.00	0.00	0.09	-0.01	-0.02	D201
S202	Hareketli yük	0.00	0.00	0.06	-0.01	-0.02	D201
S202	Olu yük	0.00	0.00	0.02	0.00	0.00	D201
S202	Hareketli yük	0.00	0.00	0.02	0.00	0.00	D201
S203	Olu yük	0.00	0.00	0.02	0.00	0.00	D201
S203	Hareketli yük	0.00	0.00	0.02	0.00	0.00	D201
S203	Olu yük	0.00	0.00	0.01	0.00	0.00	D201
S203	Hareketli yük	0.00	0.00	0.01	0.00	0.00	D201
S203	Olu yük	0.00	0.00	0.63	-0.02	0.03	D202
S203	Hareketli yük	0.00	0.00	0.37	-0.01	0.02	D202
S204	Olu yük	0.00	0.00	0.02	0.00	0.00	D201
S204	Hareketli yük	0.00	0.00	0.02	0.00	0.00	D201
S204	Olu yük	0.00	0.00	0.01	0.00	0.00	D201
S204	Hareketli yük	0.00	0.00	0.01	0.00	0.00	D201
S204	Olu yük	0.00	0.00	0.28	0.02	0.01	D203
S204	Hareketli yük	0.00	0.00	0.16	0.01	0.01	D203



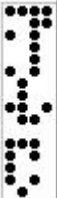
## KOLON YÜK BİLGİLERİ

Kolon no	Kombinasyon	Px t	Py t	Pz t	Mx tm	My tm	Eleman no
S205	Olu yuk	0.00	0.00	0.26	-0.01	-0.09	D205
S205	Hareketli yuk	0.00	0.00	0.18	0.00	-0.06	D205
S205	Olu yuk	0.00	0.00	0.18	-0.01	-0.06	D202
S205	Hareketli yuk	0.00	0.00	0.13	-0.01	-0.04	D202
S206	Olu yuk	0.00	0.00	0.26	0.03	-0.09	D205
S206	Hareketli yuk	0.00	0.00	0.18	0.02	-0.06	D205



## DÖŞEME ŞERİT BİLGİLERİ

YÖN	DÖŞEME ŞERİTİ
X	D104-
Y	-D101-D202=D205-
Y	-D102=D105-
Y	-D103
X	D204-
Y	-D201-D203



## DÖŞEME BİLGİLERİ

Döşeme no	Sol Aks	Sag Aks	Üst Aks	Alt Aks	yön	d, dmin cm	bo cm	bt cm	g t/m <sup>2</sup>	q t/m <sup>2</sup>	gx t/m <sup>2</sup>	gy t/m <sup>2</sup>	qx t/m <sup>2</sup>	qy t/m <sup>2</sup>
D101	1X	2X	1Y	4Y	PLAK	20≥ 8			0.712	0.500	0.034	0.678	0.024	0.476
D102	1X	4X	4Y	5Y	MERDİVEN-Y	20≥ 14			0.852	0.500	0.000	0.852	0.000	0.500
D103	3X	2X	4Y	6Y	MERDİVEN-Y	20≥ 8			0.852	0.500	0.000	0.852	0.000	0.500
D104	3X	2X	6Y	5Y	X-HURDI	20≥ 12			0.712	0.500	0.712	0.000	0.500	0.000
D105	1X	2X	5Y	3Y	Y-HURDI	20≥ 8			0.712	0.500	0.000	0.712	0.000	0.500
D201	1X	2X	1Y	4Y	PLAK	20≥ 8			0.712	0.500	0.034	0.678	0.024	0.476
D202	1X	4X	4Y	5Y	MERDİVEN-Y	20≥ 14			0.852	0.500	0.000	0.852	0.000	0.500
D203	3X	2X	4Y	6Y	MERDİVEN-Y	20≥ 8			0.852	0.500	0.000	0.852	0.000	0.500
D204	3X	2X	6Y	5Y	X-HURDI	20≥ 12			0.712	0.500	0.712	0.000	0.500	0.000
D205	1X	2X	5Y	3Y	Y-HURDI	20≥ 8			0.712	0.500	0.000	0.712	0.000	0.500

Dmin: TS500 minimum yükseklik

## DÖŞEME STATİK HESAP SONUÇLARI

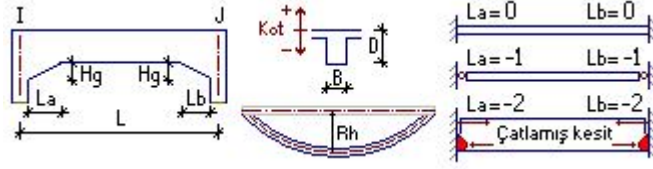
Zamana bağlı sehim :  $\delta_t = \delta_i + \delta_{ig} \cdot \lambda$ ,  $\lambda=2$  (5yıl üzeri)

Döşeme no	yön	L m	sol gGg	mesnet qGq	(tm) gQg	açıklık	sağ gGg	mesnet qGq	(tm) gQg	sehim < fmax $\delta_t = \delta_i + \delta_{ig} \cdot \lambda$ mm	Wk mm
D101	X	3.60	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.08 < 6.11 ✓	0.20
E1	Y	2.15	0.00	0.00	0.00	0.59	-0.51	-0.29	-0.50	0.17	
D102	X	1.70	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00 < 23.33 ✓	0.00
E1	Y	5.85	0.00	0.00	0.00	4.10	-1.66	-0.95	-1.71	0.00	
D103	X	1.70	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00 < 3.33 ✓	0.00
E1	Y	1.20	0.36	0.19	0.38	0.20	-0.83	-0.76	-0.54	0.00	
D104	X	1.65	0.06	0.04	0.04	0.78	-0.84	-0.73	-0.58	0.00 < 4.58 ✓	0.00
E1	Y	4.65	0.59	0.54	0.39	0.88	0.19	0.16	0.13	0.00	
D105	X	3.60	0.00	0.00	0.00	1.44	0.00	0.00	0.00	0.00 < 15.69 ✓	0.00
E1	Y	1.65	0.77	0.53	0.70	0.74	0.00	0.00	0.00	0.00	
D201	X	3.60	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.07 < 6.11 ✓	0.20
E1	Y	2.15	0.00	0.00	0.00	0.65	-0.50	-0.51	-0.29	0.16	
D202	X	1.70	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00 < 23.89 ✓	0.00
E1	Y	5.85	3.99	3.94	2.43	2.06	-1.65	-1.70	-0.94	0.00	
D203	X	1.70	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00 < 3.33 ✓	0.00
E1	Y	1.20	0.46	0.47	0.26	0.19	-0.76	-0.47	-0.71	0.00	
D204	X	1.65	0.05	0.04	0.04	0.83	-0.83	-0.59	-0.71	0.00 < 4.58 ✓	0.00
E1	Y	4.65	0.52	0.32	0.49	0.92	0.24	0.16	0.20	0.00	
D205	X	3.60	0.00	0.00	0.00	1.47	0.00	0.00	0.00	0.00 < 15.97 ✓	0.00
E1	Y	1.65	0.73	0.67	0.50	0.78	0.00	0.00	0.00	0.00	

## DÖŞEME BETONARME HESAP SONUÇLARI

Döşeme no		Msol (tm)	As cm <sup>2</sup>	Maç (tm)	As cm <sup>2</sup>	Msağ (tm)	As cm <sup>2</sup>	Donatı
D101	X	0.00	0.00	0.59	3.50	0.00	0.00	ø12/20 (düz)+ø12/20 (Mon.)
d=20cm	Y	0.51	1.03	0.59	3.50	0.00	0.00	ø12/20 (düz)+ø12/20 (Mon.)
D102	X	0.00	0.00	0.21	0.00	0.00	0.00	ø12/15 (düz)+ø12/15 (Mon.)
d=20cm	Y	1.71	3.53	4.10	6.65	0.00	0.00	ø14/15 (düz)+ø14/15 (Mon.)
D103	X	0.00	0.00	0.09	0.00	0.00	0.00	ø12/15 (düz)+ø12/15 (Mon.)
d=20cm	Y	0.83	1.70	0.20	0.40	0.38	0.78	ø14/15 (düz)+ø14/15 (Mon.)
D104	X	0.06	0.11	0.78	1.59	0.84	1.73	ø12/15 (düz)+ø12/15 (Mon.)
d=20cm	Y	0.00	0.00	0.88	0.00	0.59	1.20	ø14/15 (düz)+ø14/15 (Mon.)
D105	X	0.00	1.65	1.44	0.00	0.00	1.65	ø12/15 (düz)+ø12/15 (Mon.)
d=20cm	Y	0.00	0.00	0.74	1.52	0.77	1.58	ø14/15 (düz)+ø14/15 (Mon.)
D201	X	0.00	0.00	0.62	3.50	0.00	0.00	ø12/20 (düz)+ø12/20 (Mon.)
d=20cm	Y	0.51	1.03	0.65	3.50	0.00	0.00	ø12/20 (düz)+ø12/20 (Mon.)
D202	X	0.00	0.00	0.26	0.00	0.00	0.00	ø12/15 (düz)+ø12/15 (Mon.)
d=20cm	Y	1.70	3.51	2.06	4.27	3.99	6.46	ø14/15 (düz)+ø14/15 (Mon.)
D203	X	0.00	0.00	0.02	0.00	0.00	0.00	ø12/15 (düz)+ø12/15 (Mon.)
d=20cm	Y	0.76	1.55	0.19	0.38	0.47	0.96	ø14/15 (düz)+ø14/15 (Mon.)
D204	X	0.05	0.10	0.83	1.69	0.83	1.71	ø12/15 (düz)+ø12/15 (Mon.)
d=20cm	Y	0.00	0.00	0.92	0.00	0.52	1.07	ø14/15 (düz)+ø14/15 (Mon.)
D205	X	0.00	1.65	1.47	0.00	0.00	1.65	ø10/20 (düz)+ø12/30 (sol ila)+ø12/30 (sağ ila)
d=20cm	Y	0.00	0.00	0.78	1.59	0.73	1.50	ø10/20 (düz)





## KİRİŞ VE PANEL BİLGİLERİ

Kiriş no	aks	sol aks	sağ aks	D cm	B cm	G (t/m)	I/J Nokta	L m	Rh m	Tabla b/d (cm)	sol Hg/Lg (cm)	sağ Hg/Lg (cm)	Mal zeme
K101	1Y	1X	2X	60	40	0.600	1-3	3.40	0.00	18/20	0/0	0/0	E1
K102	4Y	1X	2X	60	40	0.600	4-7	3.40	0.00	36/20	0/0	0/0	E1
K103	3Y	1X	2X	60	40	0.600	8-11	3.40	0.00	18/20	0/0	0/0	E1
K104	1X	4Y	3Y	60	30	0.450	4-8	5.45	0.00	29/20	0/0	0/0	E1
K105	1X	1Y	4Y	60	30	0.450	1-4	2.20	0.00	9/20	0/0	0/0	E1
K106	2X	4Y	3Y	60	30	0.450	7-11	5.45	0.00	29/20	0/0	0/0	E1
K107	2X	1Y	2Y	60	30	0.450	3-7	2.20	0.00	9/20	0/0	0/0	E1
K201	1Y	1X	2X	60	40	0.600	2-5	3.40	0.00	18/20	0/0	0/0	E1
K202	4Y	1X	2X	60	40	0.600	6-9	3.40	0.00	36/20	0/0	0/0	E1
K203	3Y	1X	2X	60	40	0.600	10-12	3.40	0.00	18/20	0/0	0/0	E1
K204	1X	4Y	3Y	60	30	0.450	6-10	5.45	0.00	29/20	0/0	0/0	E1
K205	1X	1Y	4Y	60	30	0.450	2-6	2.20	0.00	9/20	0/0	0/0	E1
K206	2X	4Y	3Y	60	30	0.450	9-12	5.45	0.00	29/20	0/0	0/0	E1
K207	2X	1Y	2Y	60	30	0.450	5-9	2.20	0.00	9/20	0/0	0/0	E1

## KİRİŞ STATİK HESAP SONUÇLARI

ANALİZLERDE, ÇATLAMIS KESİT ETKİN KESİT RİJİTLİK ÇARPANI DİKKATE ALINMIŞTIR TBDY2018 4.5.8

K101		GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM		0.36	0.07	-0.06	0.13	-0.14	0.11	0.18	0.00	1.56 (tm)
SagM		-0.81	-0.40	-0.10	-0.30	-0.17	-0.32	-0.31	0.00	
SolV		1.40	0.54	-0.04	0.58	-0.09	0.57	0.60	0.00	Xaç (m)
SagV		-1.73	-0.77	-0.07	-0.71	-0.14	-0.72	-0.69	0.00	1.70
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM		-9.45	11.10	-2.24	1.42	-0.86	-0.04	0.40		
SagM		-9.47	11.10	-1.68	0.88	-0.86	-0.02	-0.90		
SolV		-6.96	8.20	-1.72	1.12	-0.64	-0.03	1.55	Z1=	4.02m
SagV		-6.96	8.16	-1.21	0.61	-0.63	-0.01	-1.90	Z2=	4.02m
K102		GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM		-0.70	-0.44	-0.33	-0.11	-0.35	-0.55	0.03	0.00	5.17 (tm)
SagM		-1.89	-1.06	-0.55	-0.52	-0.85	-0.76	-0.51	0.00	
SolV		1.79	1.00	0.42	0.57	0.72	0.50	0.77	0.00	Xaç (m)
SagV		-4.25	-2.39	-1.06	-1.33	-1.82	-1.39	-1.57	0.00	1.51
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM		-8.69	9.45	-0.07	-0.16	-0.71	0.00	-0.77		
SagM		-9.76	10.38	-0.31	-0.02	-0.77	0.00	-2.08		
SolV		-7.39	8.49	-1.03	0.86	-0.69	-0.02	1.98	Z1=	4.02m
SagV		-8.91	9.23	0.42	-0.73	-0.65	0.02	-4.69	Z2=	4.02m
K103		GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM		-0.10	-0.19	0.00	-0.19	-0.18	-0.30	0.10	0.00	1.56 (tm)
SagM		-1.23	-0.61	-0.44	-0.18	-0.60	-0.30	-0.32	0.00	
SolV		0.78	0.19	0.46	-0.26	0.20	-0.33	0.52	0.00	Xaç (m)
SagV		-1.91	-0.87	-0.79	-0.08	-0.87	-0.18	-0.71	0.00	1.55
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM		-10.46	8.28	1.94	-0.86	-0.65	0.02	-0.11		
SagM		-10.73	8.52	1.44	-0.37	-0.67	0.00	-1.35		
SolV		-7.32	5.72	1.83	-1.02	-0.45	0.02	0.86	Z1=	3.16m
SagV		-8.17	6.52	0.84	-0.05	-0.51	-0.01	-2.10	Z2=	3.16m
K104		GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM		0.80	0.14	-0.17	0.32	0.10	0.16	0.03	0.00	1.93 (tm)
SagM		-3.12	-1.52	-0.56	-0.96	-1.54	-1.15	-0.35	0.00	
SolV		1.03	0.19	-0.05	0.23	0.18	0.17	0.03	0.00	Xaç (m)
SagV		-3.82	-1.92	-0.91	-1.01	-1.94	-1.15	-0.75	0.00	2.64
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM		-0.84	0.55	-1.46	1.60	-0.05	-0.05	0.88		
SagM		1.60	-2.39	-6.60	7.01	0.20	-0.23	-3.43		
SolV		-0.52	0.42	-0.26	0.31	-0.04	-0.01	1.13	Z1=	3.16m
SagV		3.04	-3.89	-8.19	8.64	0.33	-0.29	-4.21	Z2=	3.16m
K105		GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM		-0.79	-0.45	-0.27	-0.19	-0.51	-0.29	-0.11	0.00	1.17 (tm)
SagM		-1.19	-0.62	-0.40	-0.22	-0.62	-0.38	-0.24	0.00	
SolV		-0.79	-0.48	-0.47	-0.01	-0.80	-0.20	0.03	0.00	Xaç (m)
SagV		-1.99	-1.03	-0.49	-0.54	-0.82	-0.74	-0.50	0.00	1.06
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM		-0.59	-0.34	-5.75	6.23	0.03	-0.20	-0.87		
SagM		-0.54	-0.46	-6.66	7.17	0.04	-0.24	-1.31		
SolV		-0.69	-0.71	-8.79	9.51	0.06	-0.31	-0.87	Z1=	4.02m
SagV		-0.90	-0.47	-8.78	9.48	0.05	-0.31	-2.19	Z2=	4.02m
K106		GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM		1.03	0.41	0.41	0.00	0.37	-0.15	0.60	0.00	2.54 (tm)
SagM		-2.65	-1.33	-1.05	-0.28	-1.34	-0.36	-0.96	0.00	
SolV		1.27	0.49	0.39	0.10	0.47	-0.12	0.63	0.00	Xaç (m)
SagV		-3.31	-1.66	-1.45	-0.21	-1.67	-0.26	-1.39	0.00	2.73
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM		0.85	-0.34	-2.67	2.26	0.04	-0.06	1.13		
SagM		-1.11	1.98	-5.06	4.50	-0.16	-0.14	-2.92		
SolV		1.35	-1.32	-0.28	0.13	0.12	0.00	1.40	Z1=	3.16m
SagV		-1.09	1.51	-3.07	2.77	-0.12	-0.09	-3.65	Z2=	3.16m
K107		GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM		-0.82	-0.49	-0.32	-0.17	-0.54	-0.27	-0.18	0.00	1.22 (tm)
SagM		-1.22	-0.67	-0.51	-0.16	-0.65	-0.19	-0.50	0.00	
SolV		-0.85	-0.56	-0.59	0.03	-0.85	-0.07	-0.20	0.00	Xaç (m)
SagV		-2.03	-1.10	-0.60	-0.50	-0.85	-0.58	-0.76	0.00	1.10
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM		-0.38	1.86	-7.84	6.85	-0.15	-0.20	-0.90		
SagM		-0.03	1.43	-7.84	6.90	-0.11	-0.21	-1.34		
SolV		-0.42	2.50	-11.26	9.86	-0.20	-0.29	-0.93	Z1=	4.02m
SagV		-0.21	2.25	-11.11	9.73	-0.17	-0.29	-2.24	Z2=	4.02m
K201		GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM		0.31	0.08	0.14	-0.06	0.05	-0.10	0.20	0.00	1.83 (tm)
SagM		-0.68	-0.33	-0.23	-0.10	-0.28	-0.11	-0.27	0.00	
SolV		1.31	0.52	0.57	-0.05	0.53	-0.07	0.58	0.00	Xaç (m)
SagV		-1.57	-0.70	-0.64	-0.06	-0.69	-0.08	-0.63	0.00	1.70
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM		-4.21	5.05	-1.18	0.75	-0.28	-0.02	0.35		
SagM		-4.16	5.00	-0.97	0.55	-0.28	-0.01	-0.75		
SolV		-3.02	3.64	-0.85	0.54	-0.20	-0.01	1.44	Z1=	7.44m
SagV		-3.01	3.61	-0.73	0.42	-0.20	-0.01	-1.73	Z2=	7.44m

## KİRİŞ STATİK HESAP SONUÇLARI

K202	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM	0.93	0.48	-0.35	-0.13	0.46	0.26	0.24	0.00	3.70 (tm)
SagM	-1.23	-0.66	-0.43	-0.23	-0.61	-0.45	-0.26	0.00	
SolV	2.15	1.13	0.88	0.25	1.13	0.51	0.61	0.00	Xaç (m)
SagV	-3.32	-1.83	-1.25	-0.58	-1.80	-1.23	-0.63	0.00	1.92
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM	-4.88	5.38	-0.20	0.17	-0.29	0.00	1.02		
SagM	-3.87	4.14	-0.32	0.17	-0.22	0.00	-1.36		
SolV	-3.72	4.19	0.22	-0.15	-0.23	0.00	2.37	Z1=	7.44m
SagV	-3.03	3.09	-0.44	0.23	-0.16	0.00	-3.66	Z2=	7.44m
K203	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM	0.15	-0.02	-0.09	0.07	-0.01	-0.07	0.06	0.00	1.71 (tm)
SagM	-0.69	-0.30	-0.07	-0.23	-0.29	-0.29	-0.02	0.00	
SolV	1.07	0.37	-0.17	0.55	0.37	0.34	0.03	0.00	Xaç (m)
SagV	-1.63	-0.70	-0.01	-0.70	-0.70	-0.71	0.00	0.00	1.53
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM	-5.90	4.78	1.22	-0.62	-0.33	0.01	0.17		
SagM	-6.02	4.89	0.97	-0.37	-0.34	0.01	-0.76		
SolV	-4.08	3.29	1.19	-0.72	-0.23	0.01	1.18	Z1=	6.58m
SagV	-4.62	3.74	0.52	-0.10	-0.25	0.00	-1.80	Z2=	6.58m
K204	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM	0.98	0.27	-0.30	-0.03	0.27	0.24	0.02	0.00	2.43 (tm)
SagM	-2.85	-1.37	-0.97	-0.40	-1.37	-1.30	-0.08	0.00	
SolV	1.18	0.27	0.25	0.03	0.27	0.27	0.01	0.00	Xaç (m)
SagV	-3.92	-1.97	-1.10	-0.86	-1.94	-1.88	-0.11	0.00	2.73
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM	-0.12	-0.04	-0.92	1.01	0.01	-0.03	1.08		
SagM	0.78	-1.19	-4.19	4.39	0.08	-0.11	-3.14		
SolV	-0.10	0.04	-0.20	0.22	0.00	-0.01	1.30	Z1=	6.58m
SagV	1.20	-1.59	-5.03	5.25	0.09	-0.13	-4.32	Z2=	6.58m
K205	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM	-0.65	-0.36	-0.17	-0.19	-0.38	-0.41	0.06	0.00	1.00 (tm)
SagM	-1.19	-0.56	-0.27	-0.29	-0.54	-0.57	-0.02	0.00	
SolV	-0.66	-0.36	-0.01	-0.34	-0.36	-0.69	0.34	0.00	Xaç (m)
SagV	-1.92	-0.94	-0.59	-0.35	-0.94	-0.70	-0.24	0.00	1.03
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM	-0.22	-0.12	-2.41	2.58	0.02	-0.05	-0.72		
SagM	-0.11	-0.15	-2.89	3.11	0.02	-0.06	-1.32		
SolV	-0.21	-0.23	-3.75	4.03	0.03	-0.08	-0.73	Z1=	7.44m
SagV	-0.25	-0.17	-3.80	4.07	0.03	-0.08	-2.12	Z2=	7.44m
K206	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM	1.11	0.46	0.00	0.46	0.46	0.46	-0.01	0.00	2.97 (tm)
SagM	-2.35	-1.15	-0.33	-0.82	-1.16	-1.01	-0.12	0.00	
SolV	1.45	0.58	0.16	0.42	0.58	0.57	0.01	0.00	Xaç (m)
SagV	-3.25	-1.62	-0.26	-1.36	-1.62	-1.56	-0.06	0.00	2.75
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM	0.20	-0.01	-1.84	1.52	-0.01	-0.04	1.22		
SagM	-0.64	1.09	-3.06	2.72	-0.08	-0.07	-2.59		
SolV	0.44	-0.50	-0.55	0.37	0.02	-0.01	1.60	Z1=	6.58m
SagV	-0.66	0.85	-1.87	1.67	-0.06	-0.04	-3.59	Z2=	6.58m
K207	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Maçıklık
SolM	-0.51	-0.29	-0.10	-0.20	-0.32	-0.39	0.13	0.00	0.68 (tm)
SagM	-1.33	-0.68	-0.14	-0.54	-0.68	-0.79	0.11	0.00	
SolV	-0.65	-0.39	0.13	-0.51	-0.41	-0.83	0.47	0.00	Xaç (m)
SagV	-1.93	-0.98	-0.43	-0.55	-1.00	-0.87	-0.10	0.00	1.01
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
SolM	-0.07	0.69	-3.90	3.37	-0.06	-0.08	-0.56		
SagM	-0.03	0.41	-3.56	3.04	-0.04	-0.07	-1.47		
SolV	-0.11	0.84	-5.38	4.62	-0.07	-0.11	-0.72	Z1=	7.44m
SagV	-0.03	0.72	-5.29	4.54	-0.07	-0.10	-2.13	Z2=	7.44m

## KİRİŞ BETONARME HESAP SONUÇLARI

Kiriş		üstMsol	altMsol	Mac.	üstMsağ	altMsağ	DONATI
K101	Mduz. (tm)	0.00	0.00	( 1.70m)	0.00	0.00	4ø16(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	12.44	-11.57	1.56	-13.09	11.15	4ø16(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=40	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	7.23	5.86	6.65	7.23	5.64	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	3.40			3.40		Wk=0.24<0.4 ✓
K102	Mduz. (tm)	0.00	0.00	( 1.51m)	0.00	0.00	4ø16(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	9.10	-10.99	5.17	-14.04	9.39	4ø16(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=40	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	6.65	5.54	6.65	7.23	4.73	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	2.98			3.82		Wk=0.24<0.4 ✓
K103	Mduz. (tm)	0.00	0.00	( 1.55m)	0.00	0.00	4ø16(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	11.01	-11.46	1.56	-13.41	10.46	4ø16(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=40	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	7.23	5.80	6.65	7.23	5.29	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	3.05			3.75		Wk=0.24<0.4 ✓
K104	Mduz. (tm)	0.00	0.00	( 2.64m)	0.00	0.00	3ø20(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	-13.42	5.95	1.93	3.23	-1.39	3ø20(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=30	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	6.95	3.47	4.99	4.99	2.49	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	4.18			3.90		Wk=0.24<0.4 ✓
K105	Mduz. (tm)	0.00	0.00	( 1.06m)	0.00	0.00	3ø16(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	-9.53	6.66	1.17	5.96	-7.96	3ø16(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=30	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	5.42	3.36	4.99	4.99	4.03	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	1.35			1.20		Wk=0.24<0.4 ✓
K106	Mduz. (tm)	0.00	0.00	( 2.73m)	0.00	0.00	3ø20(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	-10.52	4.14	2.54	4.89	-2.34	3ø20(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=30	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	5.42	2.71	4.99	4.99	2.49	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	4.04			4.04		Wk=0.24<0.4 ✓
K107	Mduz. (tm)	0.00	0.00	( 1.10m)	0.00	0.00	3ø16(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	-10.57	7.58	1.22	7.93	-10.02	3ø16(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=30	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	5.42	3.84	4.99	5.25	5.10	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	1.27			1.27		Wk=0.24<0.4 ✓
K201	Mduz. (tm)	0.00	0.00	( 1.70m)	0.00	0.00	4ø16(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	6.02	-5.23	1.83	-6.52	4.90	4ø16(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=40	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	6.65	3.32	6.65	6.65	3.32	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	3.40			3.40		Wk=0.24<0.4 ✓
K202	Mduz. (tm)	0.00	0.00	(1.92m)	0.00	0.00	4ø16(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	7.16	-4.91	3.70	-6.53	3.54	4ø16(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=40	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	6.65	3.32	6.65	6.65	3.32	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	3.90			2.90		Wk=0.24<0.4 ✓
K203	Mduz. (tm)	0.00	0.00	( 1.53m)	0.00	0.00	4ø16(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	6.54	-6.18	1.71	-7.53	5.92	4ø16(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=40	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	6.65	3.32	6.65	6.65	3.32	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	3.01			3.78		Wk=0.24<0.4 ✓
K204	Mduz. (tm)	0.00	0.00	( 2.73m)	0.00	0.00	3ø20(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	-9.91	3.13	2.43	2.65	-0.48	3ø20(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=30	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	5.42	2.71	4.99	4.99	2.49	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	4.04			4.04		Wk=0.24<0.4 ✓
K205	Mduz. (tm)	0.00	0.00	( 1.03m)	0.00	0.00	3ø16(mon.)+2ø14(göv.)
A4 ✓	max M (tm)	-5.31	2.47	1.00	2.28	-3.92	3ø16(düz)
D=60	fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=30	As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
	As (cm <sup>2</sup> )	4.99	2.49	4.99	4.99	2.49	ø10/10(etriye)
	Asw (cm <sup>2</sup> )	1.39			1.16		Wk=0.24<0.4 ✓

## KİRİŞ BETONARME HESAP SONUÇLARI

Kiriş	üstMsol	altMsol	Mac.	üstMsağ	altMsağ	DONATI
K206 Mduz. (tm)	0.00	0.00	( 2.75m)	0.00	0.00	3ø20(mon.)+2ø14(göv.)
A4 ✓ max M (tm)	-7.67	2.05	2.97	3.83	-1.27	3ø20(düz)
D=60 fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	1ø16(sol üst ila.)+1ø14(sağ üst ila.)
B=30 As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
As (cm <sup>2</sup> )	5.07	2.54	4.99	4.99	2.49	ø10/10(etriye)
Asw (cm <sup>2</sup> )	3.99			4.08		Wk=0.24<0.4 ✓
K207 Mduz. (tm)	0.00	0.00	( 1.01m)	0.00	0.00	3ø20(mon.)+2ø14(göv.)
A4 ✓ max M (tm)	-6.24	2.92	0.68	3.82	-5.17	3ø20(düz)
D=60 fcd (kg/cm <sup>2</sup> )	233.33	233.33	233.33	233.33	233.33	
B=30 As' (cm <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	
As (cm <sup>2</sup> )	4.99	2.49	4.99	4.99	2.60	ø10/10(etriye)
Asw (cm <sup>2</sup> )	1.42			1.13		Wk=0.24<0.4 ✓

Ck : Kiriş üstüne oturan kolonların Dinamik Etki çarpanı

A4 : (Ba=Bax+0.3\*Bay,Ba=0.3\*Bax+Bay)

## KOLON STATİK HESAP SONUÇLARI

ANALİZLERDE, ÇATLAMIŞ KESİT ETKİN KESİT RİJİTLİK ÇARPANI DİKKATE ALINMIŞTIR TBDY2018 4.5.8

S201	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Material:E1
Üst Mx	-0.76	-0.28	-0.31	-0.03	-0.26	-0.03	-0.33	0.00	
Alt Mx	-0.58	-0.22	-0.12	-0.10	-0.08	-0.09	-0.27	0.00	I = 2
Üst My	0.67	0.35	0.03	0.31	0.36	0.64	-0.31	0.00	J = 1
Alt My	0.61	0.33	0.19	0.14	0.45	0.50	-0.28	0.00	
Tx	-0.39	-0.15	-0.13	-0.02	-0.10	-0.02	-0.18	0.00	Bx= 40 cm
Ty	0.37	0.20	0.07	0.13	0.24	0.33	-0.17	0.00	By= 70 cm
Nz	3.32	0.24	0.64	-0.39	0.25	-0.75	0.99	0.00	H = 3.42 m
Deprem+X		Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z		
Üst Mx	4.92	-5.99	1.00	-0.49	0.34	0.01	-0.84		
Alt Mx	2.92	-3.62	0.58	-0.25	0.15	0.00	-0.64		
Üst My	0.34	0.19	3.87	-4.22	-0.03	0.09	0.73		
Alt My	0.01	0.36	2.48	-2.69	-0.05	0.04	0.67		
Tx	2.29	-2.81	0.46	-0.22	0.14	0.00	-0.43		
Ty	0.10	0.16	1.86	-2.02	-0.02	0.04	0.41		
Nz	-3.15	3.32	-4.50	4.48	-0.17	-0.09	3.66		
S101	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Material:E1
Üst Mx	-0.39	-0.14	0.08	-0.22	0.09	-0.24	-0.13	0.00	
Alt Mx	-0.11	-0.01	0.07	-0.08	0.10	-0.09	-0.03	0.00	I = 1
Üst My	0.25	0.15	0.23	-0.08	0.34	-0.25	0.20	0.00	J = 0
Alt My	0.82	0.46	0.33	0.14	0.57	0.09	0.27	0.00	
Tx	-0.12	-0.04	0.04	-0.08	0.05	-0.08	-0.04	0.00	Bx= 40 cm
Ty	0.27	0.15	0.14	0.01	0.23	-0.04	0.12	0.00	By= 70 cm
Nz	6.94	0.36	0.12	0.23	-0.63	-0.33	1.67	0.00	H = 4.02 m
Deprem+X		Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z		
Üst Mx	8.33	-9.81	1.43	-0.71	0.88	0.01	-0.43		
Alt Mx	8.91	-10.46	1.65	-0.90	0.91	0.02	-0.12		
Üst My	0.96	0.15	6.69	-7.29	0.00	0.28	0.27		
Alt My	1.11	0.14	7.90	-8.57	0.00	0.31	0.91		
Tx	4.29	-5.04	0.77	-0.40	0.45	0.01	-0.14		
Ty	0.52	0.07	3.63	-3.94	0.00	0.15	0.29		
Nz	-10.53	10.50	-14.77	14.88	-0.72	-0.43	7.65		
S202	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Material:E1
Üst Mx	1.20	0.59	0.41	0.18	0.54	0.24	0.39	0.00	
Alt Mx	0.92	0.45	0.19	0.26	0.29	0.30	0.31	0.00	I = 5
Üst My	0.49	0.27	-0.09	0.36	0.31	0.65	-0.42	0.00	J = 3
Alt My	0.25	0.14	0.10	0.04	0.28	0.29	-0.29	0.00	
Tx	0.62	0.30	0.18	0.13	0.24	0.16	0.21	0.00	Bx= 40 cm
Ty	0.22	0.12	0.00	0.12	0.17	0.27	-0.21	0.00	By= 70 cm
Nz	3.57	0.38	0.84	-0.46	0.35	-0.75	1.16	0.00	H = 3.42 m
Deprem+X		Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z		
Üst Mx	4.91	-5.98	1.61	-1.06	0.34	0.03	1.32		
Alt Mx	2.88	-3.58	1.16	-0.80	0.15	0.02	1.01		
Üst My	0.08	-0.99	6.10	-5.23	0.08	0.12	0.54		
Alt My	-0.14	-0.47	4.20	-3.61	0.03	0.07	0.28		
Tx	2.28	-2.80	0.81	-0.54	0.14	0.01	0.68		
Ty	-0.02	-0.43	3.01	-2.58	0.03	0.06	0.24		
Nz	2.83	-2.71	-4.54	4.10	0.12	-0.09	3.94		
S102	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Material:E1
Üst Mx	0.58	0.30	0.04	0.27	0.08	0.26	0.26	0.00	
Alt Mx	0.36	0.21	0.05	0.15	0.10	0.15	0.16	0.00	I = 3
Üst My	0.62	0.39	0.40	-0.01	0.55	-0.10	0.35	0.00	J = 0
Alt My	1.16	0.69	0.45	0.24	0.77	0.26	0.36	0.00	
Tx	0.23	0.13	0.02	0.10	0.04	0.10	0.11	0.00	Bx= 40 cm
Ty	0.44	0.27	0.21	0.06	0.33	0.04	0.18	0.00	By= 70 cm
Nz	7.45	0.65	0.31	0.34	-0.36	-0.04	1.70	0.00	H = 4.02 m
Deprem+X		Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z		
Üst Mx	8.38	-9.85	1.81	-1.07	0.88	0.03	0.64		
Alt Mx	8.96	-10.51	1.81	-1.05	0.91	0.02	0.40		
Üst My	0.50	-2.18	8.21	-7.23	0.18	0.25	0.68		
Alt My	0.81	-2.89	10.40	-9.14	0.24	0.30	1.28		
Tx	4.31	-5.06	0.90	-0.53	0.45	0.01	0.26		
Ty	0.33	-1.26	4.63	-4.07	0.10	0.14	0.49		
Nz	9.12	-8.12	-14.38	13.15	0.54	-0.37	8.21		
S203	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Material:E1
Üst Mx	-1.13	-0.62	-0.48	-0.14	-0.60	-0.27	-0.37	0.00	
Alt Mx	-1.20	-0.67	-0.44	-0.24	-0.55	-0.39	-0.40	0.00	I = 6
Üst My	-0.05	0.23	0.11	0.12	0.24	0.14	0.08	0.00	J = 4
Alt My	0.19	0.27	-0.04	0.32	0.16	0.42	-0.04	0.00	
Tx	-0.68	-0.38	-0.27	-0.11	-0.34	-0.19	-0.23	0.00	Bx= 40 cm
Ty	0.04	0.15	0.02	0.13	0.12	0.17	0.01	0.00	By= 70 cm
Nz	7.94	2.41	1.79	0.62	2.41	1.47	0.94	0.00	H = 3.42 m
Deprem+X		Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z		
Üst Mx	5.69	-6.27	0.47	-0.45	0.34	0.01	-1.25		
Alt Mx	4.59	-5.12	0.81	-0.77	0.27	0.02	-1.32		
Üst My	0.80	-0.12	0.77	-0.91	-0.01	-0.01	-0.06		
Alt My	0.37	-0.10	-0.88	0.85	-0.01	-0.09	0.21		
Tx	3.01	-3.33	0.37	-0.35	0.18	0.01	-0.75		
Ty	0.34	-0.07	-0.03	-0.02	-0.01	-0.03	0.05		
Nz	-3.51	4.32	3.74	-3.91	-0.24	0.08	8.75		

## KOLON STATİK HESAP SONUÇLARI

S103	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin	Material:El
Üst Mx	-1.36	-0.77	-0.37	-0.40	-0.54	-0.64	-0.36	0.00	
Alt Mx	-0.62	-0.34	-0.16	-0.19	-0.23	-0.31	-0.14	0.00	I = 4
Üst My	0.08	0.12	-0.19	0.31	-0.02	-0.03	0.29	0.00	J = 0
Alt My	0.73	0.44	0.12	0.32	0.40	0.18	0.31	0.00	
Tx	-0.49	-0.28	-0.13	-0.14	-0.19	-0.24	-0.12	0.00	Bx= 40 cm
Ty	0.20	0.14	-0.02	0.16	0.10	0.04	0.15	0.00	By= 70 cm
Nz	20.86	7.63	4.74	2.89	6.69	5.98	2.59	0.00	H = 4.02 m
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
Üst Mx	10.88	-11.88	1.92	-1.60	1.08	0.04	-1.50		
Alt Mx	10.23	-11.11	1.47	-1.17	0.98	0.03	-0.68		
Üst My	1.39	-0.51	3.63	-4.09	0.04	0.16	0.09		
Alt My	1.36	-0.21	6.41	-7.01	0.02	0.26	0.81		
Tx	5.25	-5.72	0.84	-0.69	0.51	0.02	-0.54		
Ty	0.69	-0.18	2.50	-2.76	0.02	0.10	0.22		
Nz	-14.21	16.41	7.04	-7.95	-1.17	0.26	22.99		
S204	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin	Material:El
Üst Mx	2.10	1.24	0.75	0.49	1.17	0.86	0.45	0.00	
Alt Mx	1.81	1.07	0.57	0.51	0.91	0.75	0.48	0.00	I = 9
Üst My	-1.34	-0.59	0.11	-0.70	-0.56	-0.51	-0.11	0.00	J = 7
Alt My	-0.69	-0.29	-0.21	-0.08	-0.35	0.26	-0.49	0.00	
Tx	1.14	0.68	0.38	0.29	0.61	0.47	0.27	0.00	Bx= 40 cm
Ty	-0.59	-0.26	-0.03	-0.23	-0.27	-0.07	-0.18	0.00	By= 70 cm
Nz	9.96	3.75	2.10	1.65	3.76	2.97	0.76	0.00	H = 3.42 m
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
Üst Mx	5.67	-5.90	0.61	-0.41	0.30	0.01	2.31		
Alt Mx	3.93	-4.04	0.08	0.03	0.15	0.00	1.99		
Üst My	0.37	-2.31	7.49	-6.50	0.17	0.15	-1.48		
Alt My	0.56	-1.80	4.83	-4.10	0.14	0.08	-0.76		
Tx	2.81	-2.91	0.20	-0.11	0.13	0.00	1.26		
Ty	0.27	-1.20	3.60	-3.10	0.09	0.07	-0.65		
Nz	3.70	-4.65	4.12	-3.58	0.27	0.08	10.98		
S104	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin	Material:El
Üst Mx	1.18	0.72	0.36	0.36	0.54	0.40	0.51	0.00	
Alt Mx	0.63	0.39	0.21	0.18	0.31	0.20	0.28	0.00	I = 7
Üst My	0.45	0.33	-0.20	0.53	0.18	0.65	-0.17	0.00	J = 0
Alt My	1.07	0.66	0.16	0.50	0.59	0.61	0.12	0.00	
Tx	0.45	0.28	0.14	0.13	0.21	0.15	0.20	0.00	Bx= 40 cm
Ty	0.38	0.25	-0.01	0.26	0.19	0.32	-0.01	0.00	By= 70 cm
Nz	21.37	8.17	4.30	3.87	7.25	4.86	4.22	0.00	H = 4.02 m
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
Üst Mx	9.58	-10.17	0.76	-0.47	0.88	0.02	1.30		
Alt Mx	9.56	-10.23	0.96	-0.66	0.88	0.02	0.69		
Üst My	1.71	-3.63	7.98	-6.88	0.32	0.23	0.49		
Alt My	1.47	-3.66	10.25	-8.93	0.31	0.29	1.18		
Tx	4.76	-5.08	0.43	-0.28	0.44	0.01	0.50		
Ty	0.79	-1.81	4.53	-3.93	0.16	0.13	0.42		
Nz	15.13	-18.29	12.88	-11.03	1.29	0.31	23.55		
S205	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin	Material:El
Üst Mx	-0.52	-0.20	0.04	-0.24	-0.20	-0.12	-0.08	0.00	
Alt Mx	-0.40	-0.16	-0.10	-0.07	-0.16	0.04	-0.20	0.00	I = 10
Üst My	3.90	2.02	1.35	0.67	2.01	1.94	0.11	0.00	J = 8
Alt My	2.37	1.24	0.75	0.49	1.28	1.09	0.11	0.00	
Tx	-0.27	-0.11	-0.02	-0.09	-0.11	-0.03	-0.08	0.00	Bx= 40 cm
Ty	1.83	0.95	0.61	0.34	0.96	0.89	0.06	0.00	By= 70 cm
Nz	7.40	2.35	0.89	1.46	2.32	2.24	0.14	0.00	H = 3.42 m
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
Üst Mx	6.82	-5.42	-1.66	0.91	0.38	-0.02	-0.57		
Alt Mx	4.60	-3.65	-1.33	0.81	0.23	-0.02	-0.44		
Üst My	0.28	0.59	5.97	-6.47	-0.03	0.17	4.30		
Alt My	-0.50	1.13	4.69	-5.02	-0.09	0.13	2.61		
Tx	3.34	-2.65	-0.88	0.50	0.18	-0.01	-0.29		
Ty	-0.07	0.50	3.12	-3.36	-0.04	0.09	2.02		
Nz	-5.15	4.75	6.00	-5.77	-0.31	0.14	8.15		
S105	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin	Material:El
Üst Mx	0.11	0.14	-0.08	0.21	0.13	0.23	-0.08	0.00	
Alt Mx	0.42	0.29	0.09	0.20	0.28	0.24	0.06	0.00	I = 8
Üst My	2.10	1.10	0.21	0.89	1.09	0.64	0.47	0.00	J = 0
Alt My	2.02	1.09	0.36	0.74	1.08	0.69	0.41	0.00	
Tx	0.17	0.14	0.00	0.13	0.13	0.15	-0.01	0.00	Bx= 40 cm
Ty	1.30	0.69	0.18	0.51	0.69	0.42	0.28	0.00	By= 70 cm
Nz	14.22	4.47	2.30	2.17	4.46	3.02	1.46	0.00	H = 3.16 m
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
Üst Mx	7.44	-5.69	-1.29	0.47	0.50	-0.01	0.12		
Alt Mx	8.88	-6.97	-1.25	0.36	0.59	0.00	0.46		
Üst My	0.41	0.69	4.77	-5.37	-0.07	0.21	2.32		
Alt My	1.18	0.19	6.56	-7.25	-0.02	0.26	2.23		
Tx	5.17	-4.01	-0.81	0.26	0.35	0.00	0.18		
Ty	0.50	0.28	3.59	-3.99	-0.03	0.15	1.44		
Nz	-15.26	14.15	15.69	-15.13	-1.07	0.45	15.68		

## KOLON STATİK HESAP SONUÇLARI

S206	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Material:El
Üst Mx	1.46	0.78	-0.20	-0.58	0.77	-0.75	0.04	0.00	
Alt Mx	0.99	0.53	0.27	0.26	0.52	0.39	0.14	0.00	I = 12
Üst My	3.13	1.65	0.48	1.17	1.66	1.48	0.16	0.00	J = 11
Alt My	1.73	0.90	0.74	0.15	0.96	0.30	0.53	0.00	
Tx	0.72	0.38	0.14	0.24	0.38	0.33	0.05	0.00	Bx= 40 cm
Ty	1.42	0.74	0.36	0.39	0.77	0.52	0.20	0.00	By= 70 cm
Nz	7.27	2.32	0.23	2.09	2.31	2.27	0.05	0.00	H = 3.42 m
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
Üst Mx	7.73	-6.23	-0.72	0.05	0.42	0.00	1.61		
Alt Mx	5.41	-4.41	-0.54	0.07	0.29	0.00	1.09		
Üst My	-0.29	-0.53	4.71	-4.03	0.04	0.10	3.45		
Alt My	-0.64	0.41	1.79	-1.56	-0.04	0.01	1.91		
Tx	3.84	-3.11	-0.37	0.03	0.21	0.00	0.79		
Ty	-0.27	-0.04	1.90	-1.63	0.00	0.03	1.57		
Nz	5.03	-4.37	1.23	-1.45	0.29	0.04	8.02		
S106	GGGGGG	QQQQQQ	Q_Q_Q	_Q_Q_Q	QQ_QQ	_QQ_QQ	Q_QQ_Q	Zemin	Material:El
Üst Mx	1.18	0.67	-0.58	-0.09	0.65	-0.13	0.56	0.00	
Alt Mx	0.93	0.55	0.40	0.15	0.54	0.20	0.37	0.00	I = 11
Üst My	1.81	0.99	0.72	0.26	0.94	0.21	0.82	0.00	J = 0
Alt My	1.86	1.06	0.53	0.53	1.02	0.63	0.47	0.00	
Tx	0.67	0.39	0.31	0.08	0.38	0.10	0.29	0.00	Bx= 40 cm
Ty	1.16	0.65	0.40	0.25	0.62	0.27	0.41	0.00	By= 70 cm
Nz	14.68	4.84	2.48	2.35	4.83	2.67	2.17	0.00	H = 3.16 m
Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y	Deprem Z			
Üst Mx	8.29	-6.53	-0.57	-0.23	0.57	0.02	1.30		
Alt Mx	9.27	-7.36	-0.93	0.05	0.63	0.01	1.03		
Üst My	-0.10	-1.26	5.44	-4.66	0.12	0.17	1.99		
Alt My	0.64	-2.99	10.84	-9.39	0.26	0.31	2.05		
Tx	5.56	-4.40	-0.47	-0.06	0.38	0.01	0.74		
Ty	0.17	-1.34	5.15	-4.45	0.12	0.15	1.28		
Nz	13.87	-12.01	3.25	-3.95	0.90	0.12	16.17		



## KOLON BETONARME HESAP SONUÇLARI

Kolon			N (t)	minor M	major M	fcd	$\rho$	As	Donatı
S201	Bx=40	X- ( G+Q )	5.277	0.41	-1.24	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	7.037	0.71	-5.28	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:2		Y- ( G+Q )	5.277	-0.95	1.65	233.3	0.0020	5.60	Cx:1 Cy:1
J:1	Hk=3.42m	Y- (G+Q+E)	9.293	-0.32	4.20	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-1.434	0.71	3.47	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	-2.593	-0.58	3.15	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S101	Bx=40	X- ( G+Q )	10.784	-0.23	-0.75	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	18.110	1.32	-11.17	233.3	0.0020	5.63	2ø10/15/10 (ettriye)
I:1		Y- ( G+Q )	10.784	0.01	2.07	233.3	0.0020	5.60	Cx:1 Cy:1
J:0	Hk=4.02m	Y- (G+Q+E)	24.777	0.85	10.57	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-6.552	0.15	6.89	233.3	0.0020	5.63	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	-10.925	-0.65	5.17	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S202	Bx=40	X- ( G+Q )	5.746	0.58	2.01	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	7.926	1.41	6.27	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:5		Y- ( G+Q )	5.746	1.39	1.28	233.3	0.0020	5.60	Cx:1 Cy:1
J:3	Hk=3.42m	Y- (G+Q+E)	9.753	2.37	5.32	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-0.675	-0.32	-2.71	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	-2.501	1.69	4.49	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S102	Bx=40	X- ( G+Q )	11.525	0.86	0.98	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	18.717	5.12	11.74	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:3		Y- ( G+Q )	11.525	0.66	2.85	233.3	0.0020	5.60	Cx:1 Cy:1
J:0	Hk=4.02m	Y- (G+Q+E)	24.977	2.39	12.96	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-3.875	-1.22	-6.18	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	-10.134	1.52	6.06	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S203	Bx=40	X- ( G+Q )	14.968	0.70	-2.75	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	14.668	0.42	-7.23	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:6		Y- ( G+Q )	14.968	-2.31	0.95	233.3	0.0020	5.60	Cx:1 Cy:1
J:4	Hk=3.42m	Y- (G+Q+E)	16.716	-2.79	1.67	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	0.199	-0.10	3.93	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	0.610	-0.65	-0.74	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S103	Bx=40	X- ( G+Q )	41.422	0.17	-2.45	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	44.903	1.21	-12.51	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:4		Y- ( G+Q )	41.422	-1.42	1.74	233.3	0.0020	5.60	Cx:1 Cy:1
J:0	Hk=4.02m	Y- (G+Q+E)	43.345	0.00	8.84	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-4.527	-0.36	8.27	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	3.928	-1.79	-2.09	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S204	Bx=40	X- ( G+Q )	19.942	-1.43	4.25	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	21.656	0.59	7.54	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:9		Y- ( G+Q )	19.942	2.49	-2.28	233.3	0.0020	5.60	Cx:1 Cy:1
J:7	Hk=3.42m	Y- (G+Q+E)	17.829	1.71	-6.93	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	1.020	-2.19	-2.99	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	1.553	1.11	-4.68	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S104	Bx=40	X- ( G+Q )	42.992	0.60	2.16	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	54.900	5.75	11.75	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:7		Y- ( G+Q )	42.992	1.51	2.56	233.3	0.0020	5.60	Cx:1 Cy:1
J:0	Hk=4.02m	Y- (G+Q+E)	49.482	2.19	12.78	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-6.125	-2.41	-6.45	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	-0.707	1.03	-4.37	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S205	Bx=40	X- ( G+Q )	14.117	3.48	-0.87	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	17.344	4.95	5.00	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:10		Y- ( G+Q )	14.117	-0.72	6.24	233.3	0.0020	5.60	Cx:1 Cy:1
J:8	Hk=3.42m	Y- (G+Q+E)	17.962	-1.22	10.07	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-0.937	0.85	4.77	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	-1.555	0.41	-2.78	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S105	Bx=40	X- ( G+Q )	27.071	4.57	1.06	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	38.658	4.96	10.11	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:8		Y- ( G+Q )	27.071	1.06	4.57	233.3	0.0020	5.60	Cx:1 Cy:1
J:0	Hk=3.16m	Y- (G+Q+E)	38.526	0.49	11.39	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-7.158	0.86	4.65	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	-7.591	-0.75	-1.72	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S206	Bx=40	X- ( G+Q )	13.893	5.12	2.32	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	17.032	4.11	7.63	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:12		Y- ( G+Q )	13.893	2.32	5.12	233.3	0.0020	5.60	Cx:1 Cy:1
J:11	Hk=3.42m	Y- (G+Q+E)	13.225	1.42	8.13	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-0.892	0.35	-4.68	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	2.915	0.02	-0.62	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$
S106	Bx=40	X- ( G+Q )	28.284	4.30	2.19	233.3	0.0020	5.60	2x3ø20+2x4ø20 (govde)
	By=70	X- (G+Q+E)	38.232	4.18	11.34	233.3	0.0020	5.60	2ø10/15/10 (ettriye)
I:11		Y- ( G+Q )	28.284	2.19	4.30	233.3	0.0020	5.60	Cx:1 Cy:1
J:0	Hk=3.16m	Y- (G+Q+E)	27.611	0.87	14.56	233.3	0.0020	5.60	
	$\beta_x = 1.000$	X- ( G-E )	-5.510	0.54	-4.42	233.3	0.0020	5.60	
A4 ✓	$\beta_y = 1.000$	Y- ( G-E )	4.409	0.25	-1.22	233.3	0.0020	5.60	$\Sigma As/Ac=0.0157$

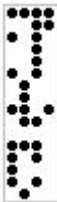
 $\beta_x, \beta_y$  : Kolon Moment büyütme katsayısı

Cx,Cy : Güçlü kolon Moment büyütme katsayısı

LİSANS : ONAT MUS.PROJE MUH.LTD.STI.

Ck : Kiriş üstüne oturan kolonların Dinamik Etki çarpanı

A4 : (Ba=Bax+0.3\*Bay, Ba=0.3\*Bax+Bay)



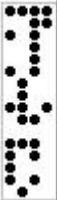
FİRMA : ONAT MUS.PROJE MUH.LTD.STI.

31-12-2025

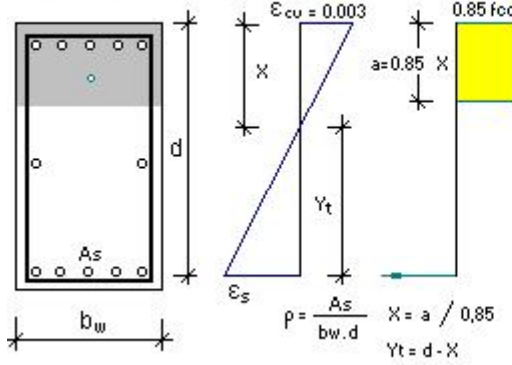
SAYFA: 33

PROJE : YANGIN MERDİVENİ

(SAKARYA MİSAFİRHANE YANGIN MERDİVENİ\_R2.ST4)



## ANİ SEHİM HESABI



$$\rho_b = \frac{0.85 \cdot 0.85 f_{cd}}{f_{yd}} \cdot \frac{6000}{6000 + f_{yd}} \quad X = \frac{6000}{6000 + f_{yd}} d$$

$$\rho < \rho_b \quad \text{Çekme kırılması} \\ a = \frac{A_s \cdot f_{yd}}{0.85 f_{cd} b_w}$$

$$\rho > \rho_b \quad \text{Basınç kırılması} \\ (0.85 \cdot f_{cd} b_w) \cdot a^2 + (6000 \cdot A_s) \cdot a - (6000 \cdot A_s \cdot 0.85 \cdot d) = 0 \\ a = \frac{6000 \cdot A_s \cdot [\sqrt{1 + f_{cd} b_w d / (2076 \cdot A_s)} - 1]}{1.7 \cdot f_{cd} b_w}$$

Çatlamış kesit atalet momenti

$$M_{cr} = 2.5 \cdot f_{ctd} \cdot I_c / y \quad I_c = b_w \cdot d^3 / 12$$

$$I_{cr} = b_w \cdot X^3 / 3 + E_s / E_c \cdot A_s \cdot (d' - X)^2$$

$$I_{ef} = \left[ \frac{M_{cr}}{M_{max}} \right]^3 \cdot I_c + \left[ 1 - \left( \frac{M_{cr}}{M_{max}} \right)^3 \right] \cdot I_{cr}$$

 $\delta_i$  = Ani sehım $\delta_t$  = Zamana bağılı sehım

$$\lambda = \frac{2}{1 + 50 \cdot \rho'}$$

$$\delta_t = \delta_i + \delta_{ig} \cdot \lambda$$

## KİRİŞ SEHİM ve ÇATLAK KONTROLÜ

(TS500-13.2.4)

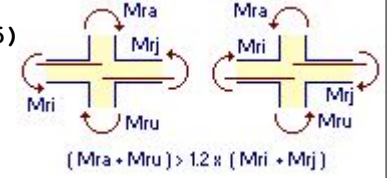
Kiriş no	sol T (t)	sağ T (t)	sol M (tm)	sağ M (tm)	M ac. (tm)	Wk mm	fmax mm	Elastik Sehım mm	Ani ( $\delta_i$ ) Sehım mm	$\delta_i + \delta_{ig} \cdot \lambda$ Sehım mm	✓ ✗
K101	1.56	-1.56	1.08	-1.09	0.61	0.23	L/360= 8.33	0.075	0.075	0.150	✓
K102	6.57	-4.64	3.95	-3.19	1.83	0.23	L/360= 8.33	0.158	0.158	0.324	✓
K103	4.46	-3.13	2.65	-2.13	1.24	0.23	L/360= 8.33	0.071	0.071	0.141	✓
K104	0.00	0.00	0.00	0.00	0.00	0.23	L/360= 13.20	0.238	0.238	0.466	✓
K105	0.71	-0.58	0.33	-0.30	0.19	0.23	L/360= 4.17	0.001	0.001	0.002	✓
K106	3.11	-2.89	3.74	-3.61	2.25	0.23	L/360= 13.20	0.275	0.275	0.526	✓
K107	0.71	-0.58	0.33	-0.30	0.19	0.23	L/360= 4.17	0.001	0.001	0.001	✓
K201	1.56	-1.56	1.08	-1.09	0.61	0.23	L/360= 8.33	0.088	0.088	0.176	✓
K202	2.04	-3.55	1.53	-2.14	1.03	0.23	L/360= 8.33	0.145	0.145	0.294	✓
K203	4.46	-3.13	2.65	-2.13	1.24	0.23	L/360= 8.33	0.088	0.088	0.175	✓
K204	0.00	0.00	0.00	0.00	0.00	0.23	L/360= 13.20	0.324	0.324	0.635	✓
K205	0.71	-0.58	0.33	-0.30	0.19	0.23	L/360= 4.17	0.004	0.004	0.009	✓
K206	3.11	-2.89	3.74	-3.61	2.25	0.23	L/360= 13.20	0.362	0.362	0.693	✓
K207	0.71	-0.58	0.33	-0.30	0.19	0.23	L/360= 4.17	0.001	0.001	0.002	✓

w : Kiriş üzerinde kat yüksekliğinde tuğla duvar

## GÜÇLÜ KOLONLARIN, KAT KESME GÜVENLİĞİ (t)

(TBDY2018-7.3.5)

Kat	Dyf	Vsx	Vkx	$\alpha_x$	Vsy	Vky	$\alpha_y$
1	1	29.33	29.33	1.00	24.03	24.03	1.00
2	2	17.56	17.56	1.00	13.46	13.46	1.00



Vs/Vk &gt; .70 KOŞULU SAĞLANMAKTADIR. GÜÇLÜ KOLONLAR, (1/α) ile ÇARPILMIŞTIR.

## GÜÇLÜ KOLON KONTROLÜ (tm)

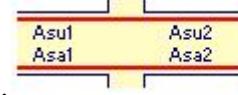
Yön	Kolon	Mrc	Kiriş	Mrb	AÇIKLAMA
+X	S201 (26.39)	26.39	K201 (16.2)	19.44	Kolon üst kat koşulu
-X	S201 (26.39)	26.39	K201 (16.2)	19.44	Kolon üst kat koşulu
+Y	S201 (48.5)	48.5	K205 (12.15)	14.58	Kolon üst kat koşulu
-Y	S201 (48.5)	48.5	K205 (12.15)	14.58	Kolon üst kat koşulu
+X	S201 (26.39)+S101 (27.97)	54.36	K101 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
-X	S201 (26.39)+S101 (27.97)	54.36	K101 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
+Y	S201 (48.5)+S101 (51.88)	100.38	K105 (12.15)	14.58	Nd < 0,10.Ac.fck koşulu
-Y	S201 (48.5)+S101 (51.88)	100.38	K105 (12.15)	14.58	Nd < 0,10.Ac.fck koşulu
+X	S202 (26.52)	26.52	K201 (16.2)	19.44	Kolon üst kat koşulu
-X	S202 (26.52)	26.52	K201 (16.2)	19.44	Kolon üst kat koşulu
+Y	S202 (48.6)	48.6	K207 (18.62)	22.35	Kolon üst kat koşulu
-Y	S202 (48.6)	48.6	K207 (18.62)	22.35	Kolon üst kat koşulu
+X	S202 (26.52)+S102 (28.05)	54.57	K101 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
-X	S202 (26.52)+S102 (28.05)	54.57	K101 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
+Y	S202 (48.6)+S102 (51.93)	100.53	K107 (12.15)	14.58	Nd < 0,10.Ac.fck koşulu
-Y	S202 (48.6)+S102 (51.93)	100.53	K107 (12.15)	14.58	Nd < 0,10.Ac.fck koşulu
+X	S203 (27.48)	27.48	K202 (16.2)	19.44	Kolon üst kat koşulu
-X	S203 (27.48)	27.48	K202 (16.2)	19.44	Kolon üst kat koşulu
+Y	S203 (50.12)	50.12	K204 (18.62)+K205 (12.15)	36.93	Kolon üst kat koşulu
-Y	S203 (50.12)	50.12	K204 (18.62)+K205 (12.15)	36.93	Kolon üst kat koşulu
+X	S203 (27.48)+S103 (31.7)	59.17	K102 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
-X	S203 (27.48)+S103 (31.7)	59.17	K102 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
+Y	S203 (50.12)+S103 (55.7)	105.82	K104 (18.62)+K105 (12.15)	36.93	Nd < 0,10.Ac.fck koşulu
-Y	S203 (50.12)+S103 (55.7)	105.82	K104 (18.62)+K105 (12.15)	36.93	Nd < 0,10.Ac.fck koşulu
+X	S204 (28.47)	28.47	K202 (16.2)	19.44	Kolon üst kat koşulu
-X	S204 (28.47)	28.47	K202 (16.2)	19.44	Kolon üst kat koşulu
+Y	S204 (50.36)	50.36	K206 (18.62)+K207 (18.62)	44.7	Kolon üst kat koşulu
-Y	S204 (50.36)	50.36	K206 (21.48)+K207 (18.62)	48.12	Kolon üst kat koşulu
+X	S204 (28.47)+S104 (33.06)	61.53	K102 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
-X	S204 (28.47)+S104 (33.06)	61.53	K102 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
+Y	S204 (50.36)+S104 (56.88)	107.25	K106 (18.62)+K107 (12.15)	36.93	Nd < 0,10.Ac.fck koşulu
-Y	S204 (50.36)+S104 (56.88)	107.25	K106 (18.62)+K107 (12.15)	36.93	Nd < 0,10.Ac.fck koşulu
+X	S205 (27.86)	27.86	K203 (16.2)	19.44	Kolon üst kat koşulu
-X	S205 (27.86)	27.86	K203 (16.2)	19.44	Kolon üst kat koşulu
+Y	S205 (50.39)	50.39	K204 (18.62)	22.35	Kolon üst kat koşulu
-Y	S205 (50.39)	50.39	K204 (18.62)	22.35	Kolon üst kat koşulu
+X	S205 (27.86)+S105 (30.85)	58.7	K103 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
-X	S205 (27.86)+S105 (30.85)	58.7	K103 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
+Y	S205 (50.39)+S105 (54.72)	105.12	K104 (18.62)	22.35	Nd < 0,10.Ac.fck koşulu
-Y	S205 (50.39)+S105 (54.72)	105.12	K104 (18.62)	22.35	Nd < 0,10.Ac.fck koşulu
+X	S206 (27.81)	27.81	K203 (16.2)	19.44	Kolon üst kat koşulu
-X	S206 (27.81)	27.81	K203 (16.2)	19.44	Kolon üst kat koşulu
+Y	S206 (49.36)	49.36	K206 (22.34)	26.81	Kolon üst kat koşulu
-Y	S206 (49.36)	49.36	K206 (18.62)	22.35	Kolon üst kat koşulu
+X	S206 (27.81)+S106 (30.79)	58.6	K103 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
-X	S206 (27.81)+S106 (30.79)	58.6	K103 (16.2)	19.44	Nd < 0,10.Ac.fck koşulu
+Y	S206 (49.36)+S106 (52.5)	101.86	K106 (18.62)	22.35	Nd < 0,10.Ac.fck koşulu
-Y	S206 (49.36)+S106 (52.5)	101.86	K106 (18.62)	22.35	Nd < 0,10.Ac.fck koşulu

## KOLON-KİRİŞ BİRLEŞİM KESME GÜVENLİK KONTROLU

TBDY 2018-7.5'e göre yapılmıştır.

 $V_e = 1.25 \text{ fyk (As1+As2) - Vkol} < V_{\max} = (1.7 \div 1.0) b_j h_c \sqrt{f_{ck}}$ 

Konsol kirişler, Kolon-kiriş birleşim kontrolunda dikkate alınmamıştır.

 $B_j \text{ genişlik opsiyonu : } b_j = \min(B_{w1}, B_{w2}, B_c, (B_{w1} + 2.X1), (B_{w2} + 2.X2))$ 

$$\begin{aligned} &Asu1 + Asa2 \\ &A_{st} > Asa1 + Asu2 \end{aligned}$$

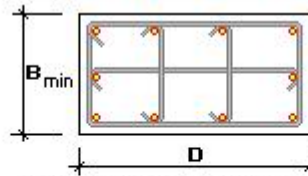
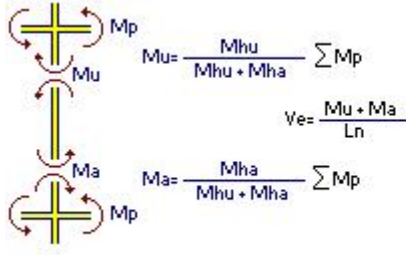
Perdelerde kolon-kiriş birleşim kontrolu yapılmaz. Sadece kolonlarda yapılır.

Kolon	Bx/By	bw1	bw2	bj	Asu1	Asa1	Asu2	Asa2	Ast	Vkol	Ve	Vmax	AÇIKLAMA
S201	x	40	50.0	20.0	40.0	0.0	0.0	8.0	8.0	8.0	0.0	42.2 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S201	y	70	15.0	25.0	30.0	0.0	0.0	6.0	6.0	6.0	0.0	31.7 < 124.2	✓
S101	x	40	50.0	20.0	40.0	0.0	0.0	8.0	8.0	8.0	2.3	39.9 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S101	y	70	15.0	25.0	30.0	0.0	0.0	6.0	6.0	6.0	1.9	29.8 < 124.2	✓
S202	x	40	20.0	50.0	40.0	8.0	8.0	0.0	0.0	8.0	0.0	42.2 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S202	y	70	25.0	15.0	30.0	0.0	0.0	9.4	9.4	9.4	0.0	49.5 < 124.2	✓
S102	x	40	20.0	50.0	40.0	8.0	8.0	0.0	0.0	8.0	2.3	40.0 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S102	y	70	25.0	15.0	30.0	0.0	0.0	6.0	6.0	6.0	2.6	29.1 < 124.2	✓
S203	x	40	50.0	20.0	40.0	0.0	0.0	8.0	8.0	8.0	0.0	42.2 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S203	y	70	25.0	15.0	30.0	0.0	0.0	9.4	9.4	9.4	0.0	49.5 < 124.2	✓
S103	x	40	50.0	20.0	40.0	0.0	0.0	8.0	8.0	8.0	3.0	39.2 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S103	y	70	25.0	15.0	30.0	0.0	0.0	9.4	9.4	9.4	0.0	49.5 < 124.2	✓
S204	x	40	20.0	50.0	40.0	8.0	8.0	0.0	0.0	8.0	0.0	42.2 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S204	y	70	15.0	25.0	30.0	0.0	0.0	11.0	9.4	11.0	0.0	57.6 < 124.2	✓
S104	x	40	20.0	50.0	40.0	8.0	8.0	0.0	0.0	8.0	2.8	39.4 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S104	y	70	15.0	25.0	30.0	0.0	0.0	9.4	9.4	9.4	3.1	46.4 < 124.2	✓
S205	x	40	20.0	50.0	40.0	0.0	0.0	8.0	8.0	8.0	0.0	42.2 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S205	y	70	25.0	15.0	30.0	9.4	9.4	0.0	0.0	9.4	0.0	49.5 < 124.2	✓
S105	x	40	20.0	50.0	40.0	0.0	0.0	8.0	8.0	8.0	2.7	39.6 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S105	y	70	25.0	15.0	30.0	9.4	9.4	0.0	0.0	9.4	3.1	46.4 < 124.2	✓
S206	x	40	50.0	20.0	40.0	8.0	8.0	0.0	0.0	8.0	0.0	42.2 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S206	y	70	15.0	25.0	30.0	11.4	9.4	0.0	0.0	11.4	0.0	60.0 < 124.2	✓
S106	x	40	50.0	20.0	40.0	8.0	8.0	0.0	0.0	8.0	3.1	39.1 < 94.7	$V = 1.0 \cdot b_j \cdot h_c \cdot \sqrt{f_{ck}}$
S106	y	70	15.0	25.0	30.0	9.4	9.4	0.0	0.0	9.4	1.6	47.9 < 124.2	✓

## KOLONLARIN KESME DAYANIM KONTROLU

 $V_w = (A_{sw}/s) \cdot f_{ywd} \cdot d$  ,  $V_{cr} = 0.65 \cdot f_{ctd} \cdot A_c$  ,  $V_r = 0.8 \cdot V_{cr} + V_w$  ,  $0.85 \cdot A_c \cdot v_{fck} \geq V_d$  (t, cm<sup>2</sup>) TBDY2018-7.3.7 $V_{fr} = (f_{ctd} \cdot A_c + \mu \cdot A_s \cdot f_{yd}) =$  İş Derzi Sürtünme Kesme Dayanımı TBDY2018-7.6.7.1 $\mu = 1$  (pürüzlendirilmiş yüzey  $\geq 5\text{mm}$ )  $f_{ctd} = 13.79 \text{ (kg/cm}^2\text{)}$ 

Kolon		Ac	As	A <sub>sw</sub> /s	V <sub>w</sub>	V <sub>cr</sub>	V <sub>d</sub>	V <sub>r</sub> =0.8 V <sub>cr</sub> + V <sub>w</sub>	V <sub>fr</sub>
S201	x	2800	18.85	0.3140	45.871	25.106	3.377	65.956 ✓	68.855 ✓
S201	y	2800	18.85	0.2355	60.206	25.106	3.360	80.291 ✓	68.855 ✓
S101	x	2800	18.85	0.3140	45.871	25.106	5.253	65.956 ✓	68.855 ✓
S101	y	2800	18.85	0.2355	60.206	25.106	5.394	80.291 ✓	68.855 ✓
S202	x	2800	18.85	0.3140	45.871	25.106	3.719	65.956 ✓	68.855 ✓
S202	y	2800	18.85	0.2355	60.206	25.106	3.348	80.291 ✓	68.855 ✓
S102	x	2800	18.85	0.3140	45.871	25.106	5.425	65.956 ✓	68.855 ✓
S102	y	2800	18.85	0.2355	60.206	25.106	5.633	80.291 ✓	68.855 ✓
S203	x	2800	18.85	0.3140	45.871	25.106	4.390	65.956 ✓	68.855 ✓
S203	y	2800	18.85	0.2355	60.206	25.106	3.749	80.291 ✓	68.855 ✓
S103	x	2800	18.85	0.3140	45.871	25.106	6.487	65.956 ✓	68.855 ✓
S103	y	2800	18.85	0.2355	60.206	25.106	6.197	80.291 ✓	68.855 ✓
S204	x	2800	18.85	0.3140	45.871	25.106	4.725	65.956 ✓	68.855 ✓
S204	y	2800	18.85	0.2355	60.206	25.106	4.452	80.291 ✓	68.855 ✓
S104	x	2800	18.85	0.3140	45.871	25.106	5.803	65.956 ✓	68.855 ✓
S104	y	2800	18.85	0.2355	60.206	25.106	5.730	80.291 ✓	68.855 ✓
S205	x	2800	18.85	0.3140	45.871	25.106	3.710	65.956 ✓	68.855 ✓
S205	y	2800	18.85	0.2355	60.206	25.106	6.149	80.291 ✓	68.855 ✓
S105	x	2800	18.85	0.3140	45.871	25.106	5.480	65.956 ✓	68.855 ✓
S105	y	2800	18.85	0.2355	60.206	25.106	6.618	80.291 ✓	68.855 ✓
S206	x	2800	18.85	0.3140	45.871	25.106	4.940	65.956 ✓	68.855 ✓
S206	y	2800	18.85	0.2355	60.206	25.106	5.646	80.291 ✓	68.855 ✓
S106	x	2800	18.85	0.3140	45.871	25.106	6.610	65.956 ✓	68.855 ✓
S106	y	2800	18.85	0.2355	60.206	25.106	7.104	80.291 ✓	68.855 ✓



$$\xi = \frac{F_k \cdot L_{etr}}{A_c \cdot H_k} \geq 0.0025$$

$$V_r = 0.65 \cdot A_c \cdot f_{ctd} + \xi \cdot A_c \cdot f_{yd} > V_e$$

$$\text{Dikdörtgen kolonlarda } L_{etr} \approx D \quad A_c = B \cdot D$$

$$\xi = \frac{F_k \cdot D}{B \cdot D \cdot H_k} = \frac{F_k}{B \cdot H_k}$$

$$V_r = 0.65 \cdot B \cdot D \cdot f_{ctd} + F_k \cdot D \cdot f_{yd} / H_k > V_e$$

Ln : Kolon kirişler arası serbest yüksekliği

Hk : Kolon kat yüksekliği

Fk : Kolon boyunca etriye alan toplamı

Letr : hesap doğrultusundaki etriye boylarının toplamı

$$V_e > V_d(G+Q+D.E, B_{ax}+0.3 \times B_{ay}) \Rightarrow V_e = V_d(G+Q+D.E, B_{ax}+0.3 \times B_{ay})$$

10cm'den geniş tuğla duvarlar, kesme güvenliğinde dikkate alınmıştır.

TBDY2018-7.3.7

### KOLONLARIN KESME GÜVENLİK KONTROLÜ

Kolon	+X Mp Mc Mr	-X Mp Mc Mr	+Y Mp Mc Mr	-Y Mp Mc Mr
S201 Lnx= 2.82 Lny= 2.82	0.00 18.78 + Mu= 30.90 30.90 18.78 + Ma= 5.06 32.53 Ve= 10.79 Vr= 68.81 ✓	0.00 -18.78 + Mu= 30.90 30.90 -18.78 + Ma= 5.06 32.53 Ve= 10.79 Vr= 68.81 ✓	0.00 14.08 + Mu= 56.96 56.96 14.08 + Ma= 3.81 60.59 Ve= 9.31 Vr= 60.21 ✓	0.00 -14.08 + Mu= 56.96 56.96 -14.08 + Ma= 3.81 60.59 Ve= 9.31 Vr= 60.21 ✓
S101 Lnx= 3.42 Lny= 3.42	30.90 18.78 + Mu= 13.90 32.53 0.00 + Ma= 32.53 0.00 Ve= 13.58 Vr= 68.81 ✓	30.90 -18.78 + Mu= 13.90 32.53 0.00 + Ma= 32.53 0.00 Ve= 13.58 Vr= 68.81 ✓	56.96 14.08 + Mu= 10.28 60.59 0.00 + Ma= 60.59 0.00 Ve= 16.87 Vr= 60.21 ✓	56.96 -14.08 + Mu= 10.28 60.59 0.00 + Ma= 60.59 0.00 Ve= 16.87 Vr= 60.21 ✓
S202 Lnx= 2.82 Lny= 2.82	0.00 18.78 + Mu= 31.03 31.03 18.78 + Ma= 5.00 32.62 Ve= 12.02 Vr= 68.81 ✓	0.00 -18.78 + Mu= 31.03 31.03 -18.78 + Ma= 5.00 32.62 Ve= 12.02 Vr= 68.81 ✓	0.00 21.69 + Mu= 57.07 57.07 14.08 + Ma= 4.77 60.64 Ve= 12.04 Vr= 60.21 ✓	0.00 -21.69 + Mu= 57.07 57.07 -14.08 + Ma= 4.77 60.64 Ve= 12.04 Vr= 60.21 ✓
S102 Lnx= 3.42 Lny= 3.42	31.03 18.78 + Mu= 13.97 32.62 0.00 + Ma= 32.62 0.00 Ve= 13.62 Vr= 68.81 ✓	31.03 -18.78 + Mu= 13.97 32.62 0.00 + Ma= 32.62 0.00 Ve= 13.62 Vr= 68.81 ✓	57.07 14.08 + Mu= 9.39 60.64 0.00 + Ma= 60.64 0.00 Ve= 19.22 Vr= 60.21 ✓	57.07 -14.08 + Mu= 9.39 60.64 0.00 + Ma= 60.64 0.00 Ve= 19.22 Vr= 60.21 ✓
S203 Lnx= 2.82 Lny= 1.96	0.00 18.78 + Mu= 32.02 32.02 18.78 + Ma= 5.65 36.38 Ve= 11.08 Vr= 68.81 ✓	0.00 -18.78 + Mu= 32.02 32.02 -18.78 + Ma= 5.65 36.38 Ve= 11.08 Vr= 68.81 ✓	0.00 35.77 + Mu= 58.70 58.70 35.77 + Ma= 6.96 64.86 Ve= 3.30 Vr= 60.21 ✓	0.00 -35.77 + Mu= 58.70 58.70 -35.77 + Ma= 6.96 64.86 Ve= 3.30 Vr= 60.21 ✓
S103 Lnx= 3.42 Lny= 2.56	32.02 18.78 + Mu= 13.21 36.38 0.00 + Ma= 36.38 0.00 Ve= 14.50 Vr= 68.81 ✓	32.02 -18.78 + Mu= 13.21 36.38 0.00 + Ma= 36.38 0.00 Ve= 14.50 Vr= 68.81 ✓	58.70 35.77 + Mu= 29.62 64.86 0.00 + Ma= 64.86 0.00 Ve= 13.79 Vr= 60.21 ✓	58.70 -35.77 + Mu= 29.62 64.86 0.00 + Ma= 64.86 0.00 Ve= 13.79 Vr= 60.21 ✓
S204 Lnx= 2.82 Lny= 1.96	0.00 18.78 + Mu= 33.05 33.05 18.78 + Ma= 5.46 37.80 Ve= 13.66 Vr= 68.81 ✓	0.00 -18.78 + Mu= 33.05 33.05 -18.78 + Ma= 5.46 37.80 Ve= 13.66 Vr= 68.81 ✓	0.00 43.37 + Mu= 58.96 58.96 35.77 + Ma= 13.48 66.24 Ve= 14.28 Vr= 60.21 ✓	0.00 -46.75 + Mu= 58.96 58.96 -35.77 + Ma= 13.48 66.24 Ve= 14.28 Vr= 60.21 ✓
S104 Lnx= 3.42 Lny= 2.56	33.05 18.78 + Mu= 13.43 37.80 0.00 + Ma= 37.80 0.00 Ve= 14.98 Vr= 68.81 ✓	33.05 -18.78 + Mu= 13.43 37.80 0.00 + Ma= 37.80 0.00 Ve= 14.98 Vr= 68.81 ✓	58.96 35.77 + Mu= 22.42 66.24 0.00 + Ma= 66.24 0.00 Ve= 18.86 Vr= 60.21 ✓	58.96 -35.77 + Mu= 22.42 66.24 0.00 + Ma= 66.24 0.00 Ve= 18.86 Vr= 60.21 ✓
S205 Lnx= 2.82 Lny= 2.82	0.00 18.78 + Mu= 32.41 32.41 18.78 + Ma= 7.33 35.49 Ve= 13.41 Vr= 68.81 ✓	0.00 -18.78 + Mu= 32.41 32.41 -18.78 + Ma= 7.33 35.49 Ve= 13.41 Vr= 68.81 ✓	0.00 21.69 + Mu= 58.99 58.99 21.69 + Ma= 10.75 63.78 Ve= 15.88 Vr= 60.21 ✓	0.00 -21.69 + Mu= 58.99 58.99 -21.69 + Ma= 10.75 63.78 Ve= 15.88 Vr= 60.21 ✓

## KOLONLARIN KESME GÜVENLİK KONTROLU

Kolon	Mp	+X Mc	Mr	Mp	-X Mc	Mr	Mp	+Y Mc	Mr	Mp	-Y Mc	Mr
S105		32.41			32.41			58.99			58.99	
Lnx= 2.56	18.78	+	Mu= 11.61	-18.78	+	Mu= 11.61	21.69	+	Mu= 11.20	-21.69	+	Mu= 11.20
Lny= 2.56		35.49			35.49			63.78			63.78	
	0.00	+	Ma= 35.49	0.00	+	Ma= 35.49	0.00	+	Ma= 63.78	0.00	+	Ma= 63.78
		0.00			0.00			0.00			0.00	
	Ve= 18.40		Vr= 68.81 ✓	Ve= 18.40		Vr= 68.81 ✓	Ve= 18.63		Vr= 60.21 ✓	Ve= 18.63		Vr= 60.21 ✓
S206		0.00			0.00			0.00			0.00	
Lnx= 2.82	18.78	+	Mu= 32.37	-18.78	+	Mu= 32.37	26.08	+	Mu= 57.88	-21.69	+	Mu= 57.88
Lny= 2.82		32.37			32.37			57.88			57.88	
	18.78	+	Ma= 7.57	-18.78	+	Ma= 7.57	21.69	+	Ma= 5.43	-21.69	+	Ma= 5.43
		35.43			35.43			61.26			61.26	
	Ve= 14.16		Vr= 68.81 ✓	Ve= 14.16		Vr= 68.81 ✓	Ve= 11.35		Vr= 60.21 ✓	Ve= 11.35		Vr= 60.21 ✓
S106		32.37			32.37			57.88			57.88	
Lnx= 2.56	18.78	+	Mu= 11.36	-18.78	+	Mu= 11.36	21.69	+	Mu= 16.31	-21.69	+	Mu= 16.31
Lny= 2.56		35.43			35.43			61.26			61.26	
	0.00	+	Ma= 35.43	0.00	+	Ma= 35.43	0.00	+	Ma= 61.26	0.00	+	Ma= 61.26
		0.00			0.00			0.00			0.00	
	Ve= 18.28		Vr= 68.81 ✓	Ve= 18.28		Vr= 68.81 ✓	Ve= 22.27		Vr= 60.21 ✓	Ve= 22.27		Vr= 60.21 ✓

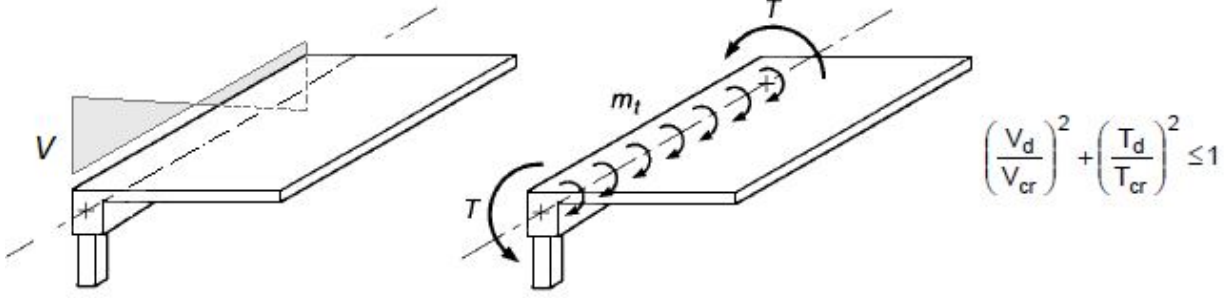
Kısa kolon bulunmamıştır.

Kısa kolonlar; kolon kenarındaki dolgu duvarlarında pencere boşluğu nedeni ile oluşabilirler.

Kısa kolon olması durumunda, kesme güvenlik hesabı kısa kolon yüksekliğine göre yapılmaktadır.

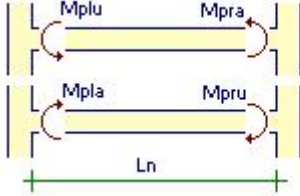


$V_{cr}=0.65 \cdot f_{ctd} \cdot b_w \cdot d$ ,  $V_c=0.80 \cdot V_{cr}$ ,  $V_w=Asw/s \cdot f_{ywd} \cdot d$ ,  $V_r=V_c+V_w > V_d$ ,  $f_{ctd}=13.79 \text{ (kg/cm}^2\text{)}$   
 $T_{cr} = 1.35 \cdot f_{ctd} \cdot S_x$ ,  $T_r=(V_d/V_{cr})^2 + (T_d/T_{cr})^2 \leq 1$  (Eğik çatlama sınırı),  $n \cdot Asw/s \geq 0.3 \cdot f_{ctd}/f_{ywd} \cdot b_w$   
 $A_{ov}/s = (V_d - V_c)/(2 \cdot d \cdot f_{ywd})$ ,  $A_{ot}/s = T_d/(2 \cdot A_e \cdot f_{ywd})$ ,  $A_o/s = A_{ov}/s + A_{ot}/s \leq Asw/s$ ,  $Asl = A_{ot}/s$  Ue  $f_{ywd}/f_{yd}$   
 $V_d: V(\min\{a+D, a+Ln/3\})$



## KİRİŞLERİN KESME ve BURULMA KONTROLÜ (tm) (TS500-8.2)

Kiriş	Vcr	Vw	Vr	Vd	Td	Tcr	Tr	Aov/s + Aot/s = Ao/s			Asw/s	✓, ✗
K101	19.73	31.56	47.34	9.55	0.3778	6.3614	0.2381	0.0000	0.0039	0.0039	0.1571	✓
K102	19.73	31.56	47.34	13.52	0.2111	6.7636	0.4706	0.0000	0.0019	0.0019	0.1571	✓
K103	19.73	31.56	47.34	10.02	1.0606	6.3614	0.2856	0.0000	0.0097	0.0097	0.1571	✓
K104	14.79	31.56	43.39	13.06	1.8111	4.0598	0.9783	0.0030	0.0248	0.0278	0.1571	✓
K105	14.79	31.56	43.39	11.51	0.1457	3.4526	0.6071	0.0000	0.0020	0.0020	0.1571	✓
K106	14.79	31.56	43.39	6.76	2.0966	4.0598	0.4757	0.0000	0.0287	0.0287	0.1571	✓
K107	14.79	31.56	43.39	13.26	0.0540	3.4526	0.8031	0.0035	0.0007	0.0043	0.1571	✓
K201	19.73	31.56	47.34	4.86	0.2914	6.3614	0.0628	0.0000	0.0027	0.0027	0.1571	✓
K202	19.73	31.56	47.34	6.14	0.2147	6.7636	0.0978	0.0000	0.0033	0.0033	0.1571	✓
K203	19.73	31.56	47.34	6.01	0.8823	6.3614	0.1120	0.0000	0.0081	0.0081	0.1571	✓
K204	14.79	31.56	43.39	9.74	1.5113	4.0598	0.5723	0.0000	0.0207	0.0207	0.1571	✓
K205	14.79	31.56	43.39	5.89	0.1321	3.4526	0.1601	0.0000	0.0019	0.0019	0.1571	✓
K206	14.79	31.56	43.39	5.23	1.8668	4.0598	0.3364	0.0000	0.0256	0.0256	0.1571	✓
K207	14.79	31.56	43.39	7.14	0.0360	3.4526	0.2331	0.0000	0.0036	0.0036	0.1571	✓



$$V_e = \frac{M_{plu} + M_{pra}}{L_n}$$

$$V_e = \frac{M_{pla} + M_{pru}}{L_n}$$

$$V_e > V_d(G+Q+D.E, Bax+0.3 \times Bay) \Rightarrow V_e = V_d(G+Q+D.E, Bax+0.3 \times Bay) *$$

$$V_w = (A_{sw}/s) \cdot f_{ywd} \cdot d, \quad V_{cr} = 0.65 \cdot f_{ctd} \cdot A_c, \quad V_r = 0.8 \cdot V_{cr} + V_w, \quad 0.85 \cdot A_c \cdot \sqrt{f_{ck}} \geq V_d \quad \text{TBDY2018-7.4.5.2}$$

## KİRİŞLERİN KESME GÜVENLİK KONTROLU (tm) TBDY2018-7.4.5

Kiriş	Ln	Mplu	Mpla	Mpru	Mpra	Vdl +	Vpl	=	Vel <	Vrl	Vdr +	Vpr	=	Ver <	Vrr	✓, ✗
K101	3.00	18.78	18.78	18.78	18.78	1.94	12.52	14.46	31.54	2.50	12.52	15.02	31.54	✓		
K102	3.00	18.78	18.78	18.78	18.78	2.79	12.52	15.31	31.54	6.64	12.52	19.16	31.54	✓		
K103	3.00	18.78	18.78	18.78	18.78	0.97	12.52	13.49	31.54	2.78	12.52	15.30	31.54	✓		
K104	4.75	21.69	21.69	21.69	21.69	1.21	9.13	3.09*	31.54	5.74	9.13	14.87	31.54	✓		
K105	1.50	14.08	14.08	14.08	14.08	1.27	18.78	20.05	31.54	3.02	18.78	21.79	31.54	✓		
K106	4.75	21.69	21.69	21.69	21.69	1.76	9.13	6.05*	43.37	4.97	9.13	14.10	43.37	✓		
K107	1.50	14.08	14.08	14.08	14.08	1.40	18.78	20.18	31.54	3.12	18.78	21.90	31.54	✓		
K201	3.00	18.78	18.78	18.78	18.78	1.83	12.52	13.56*	31.54	2.27	12.52	13.76*	31.54	✓		
K202	3.00	18.78	18.78	18.78	18.78	3.28	12.52	15.79	31.54	5.15	12.52	14.83*	31.54	✓		
K203	3.00	18.78	18.78	18.78	18.78	1.45	12.52	13.96	31.54	2.33	12.52	14.85	31.54	✓		
K204	4.75	21.69	21.69	21.69	21.69	1.45	9.13	2.21*	43.37	5.88	9.13	15.01	43.37	✓		
K205	1.50	14.08	14.08	14.08	14.08	1.02	18.78	13.65*	31.54	2.87	18.78	15.31*	31.54	✓		
K206	4.75	25.06	21.69	26.08	21.69	2.04	9.84	4.13*	43.37	4.87	10.05	11.26*	43.37	✓		
K207	1.50	21.69	21.69	21.69	21.69	1.04	28.92	18.38*	31.54	2.91	28.92	19.45*	31.54	✓		

## TEMELLERE GELEN KOLON YÜKLERİ

S101	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin
N	6.94	0.36	(azaltma)	Nq=	0.36×1.000	=	0.36)	0.00
Alt Mx	-0.11	-0.01	0.07	-0.08	0.10	-0.09	-0.03	0.00
Alt My	0.82	0.46	0.33	0.14	0.57	0.09	0.27	0.00
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y		
N	-10.53	10.50	-14.77	14.88	-0.72	-0.43	0.00	
Alt Mx	8.91	-10.46	1.65	-0.90	0.91	0.02	0.00	
Alt My	1.11	0.14	7.90	-8.57	0.00	0.31	0.00	
S102	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin
N	7.45	0.65	(azaltma)	Nq=	0.65×1.000	=	0.65)	0.00
Alt Mx	0.36	0.21	0.05	0.15	0.10	0.15	0.16	0.00
Alt My	1.16	0.69	0.45	0.24	0.77	0.26	0.36	0.00
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y		
N	9.12	-8.12	-14.38	13.15	0.54	-0.37	0.00	
Alt Mx	8.96	-10.51	1.81	-1.05	0.91	0.02	0.00	
Alt My	0.81	-2.89	10.40	-9.14	0.24	0.30	0.00	
S103	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin
N	20.86	7.63	(azaltma)	Nq=	7.63×1.000	=	7.63)	0.00
Alt Mx	-0.62	-0.34	-0.16	-0.19	-0.23	-0.31	-0.14	0.00
Alt My	0.73	0.44	0.12	0.32	0.40	0.18	0.31	0.00
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y		
N	-14.21	16.41	7.04	-7.95	-1.17	0.26	0.00	
Alt Mx	10.23	-11.11	1.47	-1.17	0.98	0.03	0.00	
Alt My	1.36	-0.21	6.41	-7.01	0.02	0.26	0.00	
S104	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin
N	21.37	8.17	(azaltma)	Nq=	8.17×1.000	=	8.17)	0.00
Alt Mx	0.63	0.39	0.21	0.18	0.31	0.20	0.28	0.00
Alt My	1.07	0.66	0.16	0.50	0.59	0.61	0.12	0.00
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y		
N	15.13	-18.29	12.88	-11.03	1.29	0.31	0.00	
Alt Mx	9.56	-10.23	0.96	-0.66	0.88	0.02	0.00	
Alt My	1.47	-3.66	10.25	-8.93	0.31	0.29	0.00	
S105	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin
N	14.22	4.47	(azaltma)	Nq=	4.47×1.000	=	4.47)	0.00
Alt Mx	0.42	0.29	0.09	0.20	0.28	0.24	0.06	0.00
Alt My	2.02	1.09	0.36	0.74	1.08	0.69	0.41	0.00
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y		
N	-15.26	14.15	15.69	-15.13	-1.07	0.45	0.00	
Alt Mx	8.88	-6.97	-1.25	0.36	0.59	0.00	0.00	
Alt My	1.18	0.19	6.56	-7.25	-0.02	0.26	0.00	
S106	GGGGGG	QQQQQQ	Q_Q_Q	Q_Q_Q	QQ_QQ	QQ_QQ	Q_QQ_Q	Zemin
N	14.68	4.84	(azaltma)	Nq=	4.84×1.000	=	4.84)	0.00
Alt Mx	0.93	0.55	0.40	0.15	0.54	0.20	0.37	0.00
Alt My	1.86	1.06	0.53	0.53	1.02	0.63	0.47	0.00
	Deprem+X	Deprem-X	Deprem+Y	Deprem-Y	Rüzgar X	Rüzgar Y		
N	13.87	-12.01	3.25	-3.95	0.90	0.12	0.00	
Alt Mx	9.27	-7.36	-0.93	0.05	0.63	0.01	0.00	
Alt My	0.64	-2.99	10.84	-9.39	0.26	0.31	0.00	

TOPLAM  $\Sigma N_g = 85.53$   $\Sigma N_q = 26.12$   $\Sigma N_{qf} = 26.12$ 

## Temellerin kayma kontrolü TBDY2018-16.8.4 (t,m)

$$\phi=30.0^\circ \quad \theta=0, \beta=0, \varphi=90^\circ \quad K_p = \sin^2(90+\phi) / (1-\sin\phi)^2 = 3.0$$

Kat	Hi	Lx	Ly	RpkX = Hi·Kpd·Ly	RpkY = Hi·Kpd·Lx
TEMEL	0.40	4.30	9.35	11.22	5.16

$$R_{pX} = 11.22/1.4 = 8.01, \quad R_{pY} = 5.16/1.4 = 3.69$$

$$W_g = 85.53(\text{Yapi}) + 100.51(\text{Temel}) = 186.04$$

$$W_q = 186.04, \quad W_{qf} = 26.12$$

$$W_{qf} = W_g + C_q \cdot W_q = 212.16$$

$$V_{beX}=37.98, \quad V_{beY}=42.54 \text{ deprem, } V_{bsX}=0.0, \quad V_{bsY}=0.0 \text{ zemin}$$

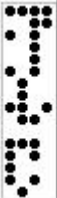
$$V_{eX}=37.98 < W_{ge} \cdot \tan\delta + 0.3 \cdot R_{pX} = 212.16 \cdot 0.5 + 0.3 \cdot 8.01 = 108.48 \quad \checkmark$$

$$V_{eY}=42.54 < W_{ge} \cdot \tan\delta + 0.3 \cdot R_{pY} = 212.16 \cdot 0.5 + 0.3 \cdot 3.69 = 107.18 \quad \checkmark$$

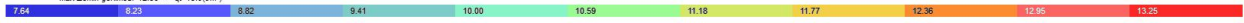
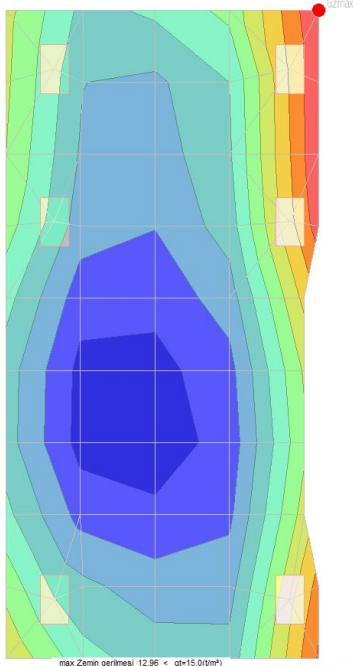
Temellerin kayma kontrolü yeterlidir

**TEMELLERE KOLONLARDAN GELEN SÜNEK TASARIM DEPREM MOMENTLERİ (tm)**Kolon ve Perdelerde  $Nez=0.6 \times Dust \times Ne$  , (Dust=3.0) TBDY2018-4.10.3.1 Bodrumsuz yapı

KOLON	Kolon/Perde koşulu	Mex1 (9)	Mex2 (10)	Mpx	Mey1 (11)	Mey2 (12)	Mpy
S101	Kolon Me=0.6×Dust×Me	16.04	-18.84		14.22	-15.42	
S102	Kolon Me=0.6×Dust×Me	16.12	-18.91		18.73	-16.45	
S103	Kolon Me=0.6×Dust×Me	18.41	-19.99		11.53	-12.62	
S104	Kolon Me=0.6×Dust×Me	17.20	-18.42		18.44	-16.08	
S105	Kolon Me=0.6×Dust×Me	15.98	-12.55		11.81	-13.06	
S106	Kolon Me=0.6×Dust×Me	16.69	-13.26		19.51	-16.90	



## TEMEL 3D GÖRÜNÜŞÜ



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FİRMA : ONAT MUS.PROJE MUH.LTD.STI.

31-12-2025

SAYFA: 46

PROJE : YANGIN MERDİVENİ

(SAKARYA MİSAFİRHANE YANGIN MERDİVENİ\_R2.ST4)

## RADYE NOKTA YÜKLERİ (t) - (m)

Nokta no	1 g	2 q	3 q	4 q	5 q	6 q	7 q	8 s	9 e	10 e	11 e	12 e	13 w	14 w	17 Ez
5 Pz	6.94	0.36	0.12	0.23	-0.63	-0.33	0.67	0.00	-18.95	18.90	-26.59	26.78	-0.72	-0.43	7.65
5 Mx	0.11	0.01	-0.07	0.08	-0.10	0.09	0.03	0.00	-16.04	18.84	-2.98	1.61	-0.91	-0.02	0.12
5 My	-0.82	-0.46	-0.33	-0.14	-0.57	-0.09	-0.27	0.00	-2.00	-0.26	-14.22	15.42	0.00	-0.31	-0.91
14 Pz	7.45	0.65	0.31	0.34	-0.36	-0.04	0.68	0.00	16.42	-14.61	-25.88	23.68	0.54	-0.37	8.21
14 Mx	-0.36	-0.21	-0.05	-0.15	-0.10	-0.15	-0.16	0.00	-16.12	18.91	-3.26	1.89	-0.91	-0.02	-0.40
14 My	-1.16	-0.69	-0.45	-0.24	-0.77	-0.26	-0.36	0.00	-1.46	5.20	-18.73	16.45	-0.24	-0.30	-1.28
16 Pz	20.86	7.63	4.74	2.89	6.69	5.98	2.59	0.00	-25.58	29.53	12.67	-14.31	-1.17	0.26	22.99
16 Mx	0.62	0.34	0.16	0.19	0.23	0.31	0.14	0.00	-18.41	19.99	-2.65	2.10	-0.98	-0.03	0.68
16 My	-0.73	-0.44	-0.12	-0.32	-0.40	-0.18	-0.31	0.00	-2.46	0.37	-11.53	12.62	-0.02	-0.26	-0.81
25 Pz	21.37	8.17	4.30	3.87	7.25	4.86	4.22	0.00	27.23	-32.93	23.18	-19.86	1.29	0.31	23.55
25 Mx	-0.63	-0.39	-0.21	-0.18	-0.31	-0.20	-0.28	0.00	-17.20	18.42	-1.72	1.18	-0.88	-0.02	-0.69
25 My	-1.07	-0.66	-0.16	-0.50	-0.59	-0.61	-0.12	0.00	-2.64	6.59	-18.44	16.08	-0.31	-0.29	-1.18
44 Pz	14.22	4.47	2.30	2.17	4.46	3.02	1.46	0.00	-27.46	25.46	28.24	-27.23	-1.07	0.45	15.68
44 Mx	-0.42	-0.29	-0.09	-0.20	-0.28	-0.24	-0.06	0.00	-15.98	12.55	2.26	-0.65	-0.59	0.00	-0.46
44 My	-2.02	-1.09	-0.36	-0.74	-1.08	-0.69	-0.41	0.00	-2.12	-0.35	-11.81	13.06	0.02	-0.26	-2.23
54 Pz	14.68	4.84	2.48	2.35	4.83	2.67	2.17	0.00	24.96	-21.62	5.84	-7.11	0.90	0.12	16.17
54 Mx	-0.93	-0.55	-0.40	-0.15	-0.54	-0.20	-0.37	0.00	-16.69	13.26	1.67	-0.08	-0.63	-0.01	-1.03
54 My	-1.86	-1.06	-0.53	-0.53	-1.02	-0.63	-0.47	0.00	-1.15	5.39	-19.51	16.90	-0.26	-0.31	-2.05

Tg= 85.53 (t) Tq= 26.12 (t) Radye temele etkiyen yükler  
Tg= 85.53 (t) Tq= 26.12 (t) Tüm yapının temel yükü

## NOKTALARIN X YÖNÜ STATİK SONUÇLARI Mx (tm)

Nokta no	1 Mg	2 Mq	3 Mq	4 Mq	5 Mq	6 Mq	7 Mq	8 Ms	9 Me	10 Me	11 Me	12 Me	13 Mw	14 Mw	17 Mez
1	-0.21	-0.11	-0.07	-0.04	-0.12	-0.07	-0.05	0.00	0.71	-1.18	-1.69	1.94	0.06	-0.04	-0.23
2	-1.15	-0.42	-0.31	-0.19	-0.39	-0.28	-0.22	0.00	-6.88	7.87	-1.55	1.15	-0.37	-0.02	-1.21
3	-2.91	-0.77	-0.52	-0.41	-0.56	-0.42	-0.51	0.00	-1.84	2.03	1.59	-1.57	-0.09	0.02	-3.09
4	0.00	-0.01	0.00	0.00	-0.01	-0.01	0.00	0.00	0.16	-0.21	-0.17	0.20	0.01	0.00	0.00
5	0.42	-0.18	-0.15	-0.07	-0.31	-0.20	-0.02	0.00	-5.15	5.26	-5.51	5.53	-0.22	-0.09	0.70
6	-1.20	-0.43	-0.32	-0.21	-0.39	-0.28	-0.24	0.00	-8.04	9.30	-1.04	0.50	-0.44	-0.01	-1.25
7	-2.93	-0.78	-0.50	-0.41	-0.56	-0.46	-0.49	0.00	-1.50	1.69	2.62	-2.61	-0.07	0.04	-3.13
8	-2.15	-0.54	-0.34	-0.24	-0.41	-0.25	-0.32	0.00	4.25	-4.77	1.17	-0.90	0.24	0.01	-2.35
9	-0.02	0.04	0.04	0.01	0.06	0.04	0.01	0.00	0.78	-0.79	0.57	-0.56	0.04	0.01	-0.04
10	-0.77	-0.26	-0.18	-0.15	-0.23	-0.13	-0.19	0.00	-5.84	6.41	-1.32	1.12	-0.30	-0.02	-0.80
11	-3.01	-0.93	-0.58	-0.48	-0.75	-0.58	-0.53	0.00	-1.93	2.16	0.45	-0.50	-0.09	0.00	-3.22
12	-1.60	-0.38	-0.23	-0.17	-0.27	-0.20	-0.22	0.00	2.79	-3.31	2.12	-1.81	0.17	0.03	-2.40
13	-0.14	-0.10	-0.04	-0.04	-0.10	-0.07	-0.03	0.00	-0.78	1.17	-1.44	1.21	-0.06	-0.02	-0.17
14	0.57	-0.08	-0.06	-0.02	-0.23	-0.10	0.02	0.00	6.62	-6.89	-3.68	3.56	0.31	-0.06	0.63
15	0.12	0.05	0.03	0.02	0.05	0.04	0.02	0.00	-0.02	0.02	0.24	-0.25	0.00	0.00	0.36
16	3.61	1.39	0.86	0.49	1.23	1.13	0.42	0.00	-6.90	8.09	3.13	-3.63	-0.34	0.07	4.00
17	-0.14	0.04	0.00	-0.04	0.03	0.12	-0.10	0.00	-8.67	9.70	-0.22	-0.19	-0.46	0.01	-0.09
18	-2.12	-0.56	-0.32	-0.26	-0.42	-0.33	-0.27	0.00	3.44	-3.91	1.53	-1.26	0.20	0.02	-2.32
19	-3.40	-1.15	-0.70	-0.56	-0.98	-0.75	-0.59	0.00	-1.38	1.56	-0.62	0.55	-0.07	-0.01	-3.67
20	-0.03	-0.06	-0.03	-0.04	-0.06	-0.06	-0.03	0.00	-0.17	0.15	0.18	-0.19	-0.01	0.01	-0.02
21	-0.49	-0.15	-0.10	-0.07	-0.13	-0.12	-0.06	0.00	0.89	-0.77	0.60	-0.68	0.03	0.01	-0.53
22	-0.79	-0.25	-0.15	-0.17	-0.22	-0.12	-0.19	0.00	-2.73	3.02	-0.68	0.56	-0.14	-0.01	-0.83
23	-2.68	-0.83	-0.48	-0.38	-0.70	-0.52	-0.40	0.00	2.44	-2.65	0.23	-0.12	0.15	0.00	-2.93
24	-0.17	-0.09	-0.04	-0.03	-0.09	-0.05	-0.04	0.00	-1.11	1.43	-1.18	0.99	-0.07	-0.02	-0.21
25	2.59	1.09	0.58	0.52	0.98	0.65	0.59	0.00	6.62	-7.65	3.70	-3.11	0.33	0.05	3.69
26	-2.55	-0.86	-0.52	-0.43	-0.76	-0.56	-0.45	0.00	-1.33	1.47	-0.48	0.43	-0.06	-0.01	-2.74
27	-0.26	-0.09	-0.06	-0.04	-0.08	-0.07	-0.04	0.00	0.02	-0.01	-0.24	0.22	-0.01	0.00	-0.27
28	-1.23	-0.42	-0.25	-0.22	-0.39	-0.28	-0.21	0.00	-0.57	0.64	-0.78	0.74	-0.04	-0.01	-1.31
29	-2.29	-0.73	-0.43	-0.34	-0.64	-0.46	-0.36	0.00	1.18	-1.46	0.66	-0.49	0.09	0.01	-2.50
30	0.88	0.38	0.19	0.19	0.36	0.24	0.18	0.00	0.97	-1.53	2.60	-2.24	0.07	0.04	0.98
31	-2.11	-0.73	-0.43	-0.38	-0.66	-0.48	-0.36	0.00	-0.88	0.92	-0.84	0.81	-0.04	-0.01	-2.27
32	-0.22	-0.08	-0.05	-0.04	-0.08	-0.07	-0.03	0.00	-0.01	-0.04	-0.15	0.16	0.00	0.00	-0.24
33	-1.26	-0.45	-0.27	-0.23	-0.42	-0.31	-0.20	0.00	-0.43	0.34	-0.74	0.75	-0.02	-0.01	-1.36
34	-1.81	-0.62	-0.35	-0.32	-0.56	-0.39	-0.31	0.00	-0.43	0.39	-0.41	0.44	0.00	-0.01	-1.96
35	-0.39	-0.13	-0.06	-0.07	-0.10	-0.07	-0.07	0.00	-0.67	0.76	-0.31	0.29	-0.02	0.00	-0.42
36	-2.05	-0.72	-0.41	-0.38	-0.68	-0.48	-0.34	0.00	-0.79	0.74	-1.22	1.22	-0.03	-0.02	-2.21
37	-0.11	-0.04	-0.03	-0.02	-0.04	-0.03	-0.01	0.00	0.78	-0.69	-0.30	0.25	0.03	0.00	-0.12
38	-1.30	-0.49	-0.26	-0.26	-0.47	-0.33	-0.20	0.00	-2.95	2.23	-0.42	0.73	-0.11	-0.01	-1.40
39	-0.42	-0.14	-0.08	-0.07	-0.13	-0.09	-0.07	0.00	-0.13	0.11	-0.04	0.05	0.00	0.00	-0.46
40	-1.77	-0.62	-0.34	-0.33	-0.58	-0.40	-0.30	0.00	-0.57	0.62	-0.99	0.96	-0.01	-0.01	-1.91
41	-2.36	-0.84	-0.46	-0.45	-0.82	-0.56	-0.37	0.00	-1.23	1.02	-1.86	1.93	-0.04	-0.03	-2.54
42	-0.03	-0.05	-0.01	-0.03	-0.05	-0.03	-0.01	0.00	-0.39	0.20	-0.59	0.68	-0.01	-0.01	-0.04
43	-0.82	-0.36	-0.18	-0.21	-0.36	-0.25	-0.15	0.00	-7.98	6.37	1.50	-0.77	-0.30	0.01	-0.88
44	2.33	0.69	0.37	0.33	0.69	0.47	0.22	0.00	-8.76	7.58	6.12	-5.57	-0.33	0.09	2.57
45	-0.49	-0.17	-0.09	-0.09	-0.16	-0.10	-0.09	0.00	-0.21	0.25	-0.21	0.20	0.00	0.00	-0.53
46	-1.85	-0.63	-0.34	-0.36	-0.62	-0.43	-0.29	0.00	0.83	-0.54	-1.72	1.58	0.04	-0.02	-1.99
47	-2.99	-1.05	-0.57	-0.57	-1.05	-0.69	-0.45	0.00	-1.24	0.89	-2.59	2.71	-0.04	-0.04	-3.23
48	0.06	0.05	0.02	0.04	0.05	0.04	0.03	0.00	0.04	0.14	0.53	-0.63	-0.01	0.01	0.49
49	-0.53	-0.23	-0.12	-0.14	-0.25	-0.16	-0.09	0.00	-7.31	5.84	2.16	-1.48	-0.27	0.02	-0.57
50	-1.51	-0.50	-0.27	-0.28	-0.49	-0.31	-0.24	0.00	-0.83	0.89	-0.68	0.62	-0.03	-0.01	-1.64
51	-2.45	-0.80	-0.41	-0.46	-0.80	-0.54	-0.34	0.00	2.17	-1.56	-2.66	2.34	0.09	-0.03	-2.65

NOKTALARIN X YÖNÜ STATİK SONUÇLARI M<sub>x</sub> (tm)

Nokta no	1 Mg	2 Mq	3 Mq	4 Mq	5 Mq	6 Mq	7 Mq	8 Ms	9 Me	10 Me	11 Me	12 Me	13 Mw	14 Mw	17 Mez
52	-2.94	-1.00	-0.56	-0.56	-1.01	-0.68	-0.44	0.00	-1.73	1.15	-0.79	1.06	-0.05	-0.01	-3.15
53	0.53	0.16	0.09	0.09	0.16	0.10	0.08	0.00	0.28	-0.18	-0.12	0.06	0.00	0.00	0.58
54	2.18	0.76	0.42	0.35	0.76	0.39	0.37	0.00	7.50	-6.16	-0.17	-0.41	0.28	0.01	2.40
55	-1.29	-0.38	-0.18	-0.21	-0.38	-0.25	-0.14	0.00	1.99	-1.67	-0.92	0.77	0.09	-0.01	-1.94
56	0.34	0.12	0.07	0.07	0.11	0.09	0.06	0.00	-0.66	0.33	0.82	-0.64	-0.02	0.01	0.36

NOKTALARIN Y YÖNÜ STATİK SONUÇLARI M<sub>y</sub> (tm)

Nokta no	1 Mg	2 Mq	3 Mq	4 Mq	5 Mq	6 Mq	7 Mq	8 Ms	9 Me	10 Me	11 Me	12 Me	13 Mw	14 Mw	17 Mez
1	0.22	0.08	0.05	0.05	0.08	0.02	0.07	0.00	-1.64	2.24	1.10	-1.38	-0.10	0.03	0.24
2	0.21	0.05	0.04	0.02	0.04	0.01	0.04	0.00	0.20	-0.14	0.35	-0.38	0.01	0.01	0.10
3	-0.16	-0.06	-0.04	-0.03	-0.05	-0.03	-0.04	0.00	-0.02	0.05	-0.46	0.45	0.00	-0.01	-0.17
4	0.80	0.06	0.03	0.04	-0.06	0.02	0.09	0.00	0.85	-2.07	-6.45	7.17	0.13	-0.14	0.87
5	1.32	0.09	0.02	0.06	-0.10	-0.04	0.14	0.00	-2.99	2.63	-6.57	6.84	-0.09	-0.12	1.46
6	0.44	0.00	-0.05	0.02	-0.10	0.03	0.01	0.00	-3.94	3.88	-5.47	5.58	-0.17	-0.11	0.52
7	0.09	0.09	0.02	0.03	0.07	0.13	-0.01	0.00	-0.64	0.67	-1.35	1.36	-0.03	-0.03	0.13
8	-0.08	0.00	0.01	-0.01	0.02	0.01	-0.02	0.00	-1.08	1.08	0.64	-0.62	-0.05	0.01	-0.09
9	0.77	0.56	0.33	0.25	0.55	0.52	0.19	0.00	-1.06	1.38	1.40	-1.47	-0.06	0.02	1.09
10	0.57	0.53	0.30	0.21	0.54	0.53	0.13	0.00	0.66	-0.72	1.41	-1.29	0.03	0.01	0.64
11	0.80	0.58	0.31	0.22	0.58	0.55	0.14	0.00	-0.19	0.12	1.48	-1.36	-0.01	0.01	0.92
12	0.19	0.05	0.00	0.02	-0.01	0.11	-0.03	0.00	1.91	-1.73	-2.76	2.56	0.08	-0.05	0.23
13	0.24	0.08	0.06	0.04	0.06	0.02	0.07	0.00	2.12	-2.75	1.73	-1.41	0.13	0.03	0.25
14	0.96	0.01	-0.01	0.01	-0.16	0.01	0.01	0.00	2.06	-1.24	-6.67	5.97	0.03	-0.10	1.54
15	3.82	1.85	1.20	0.61	1.77	1.64	0.49	0.00	0.71	-0.39	4.63	-4.70	0.06	0.06	4.24
16	5.23	2.38	1.49	0.84	2.21	2.02	0.69	0.00	-3.88	4.84	5.99	-6.31	-0.18	0.10	5.81
17	3.31	1.68	1.04	0.56	1.58	1.48	0.45	0.00	-6.08	6.84	3.55	-3.75	-0.30	0.05	3.70
18	0.63	0.58	0.30	0.26	0.59	0.56	0.16	0.00	-0.80	0.54	2.66	-2.42	-0.03	0.03	0.70
19	0.86	0.77	0.44	0.23	0.77	0.71	0.18	0.00	-0.76	0.67	2.88	-2.69	-0.04	0.03	1.02
20	0.59	-0.21	-0.14	-0.12	-0.38	-0.09	-0.15	0.00	-2.03	4.21	-10.94	9.45	-0.23	-0.16	0.69
21	-0.86	-0.01	0.02	-0.10	0.05	0.12	-0.11	0.00	0.56	-0.60	0.26	-0.18	0.01	-0.01	-1.62
22	-1.65	-0.18	-0.09	-0.23	-0.08	0.04	-0.25	0.00	1.44	-1.75	0.60	-0.37	0.07	-0.01	-1.71
23	1.86	1.19	0.65	0.48	1.16	0.91	0.48	0.00	3.81	-4.69	4.93	-4.32	0.20	0.05	2.09
24	0.62	0.49	0.23	0.27	0.47	0.47	0.16	0.00	1.55	-2.14	2.86	-2.50	0.09	0.03	0.99
25	5.85	2.75	1.46	1.25	2.56	1.85	1.29	0.00	7.83	-10.08	10.80	-9.36	0.41	0.13	6.48
26	-1.48	-0.11	-0.06	-0.20	-0.02	0.07	-0.21	0.00	0.09	-0.31	1.39	-1.18	0.01	0.01	-1.52
27	-4.19	-1.16	-0.72	-0.66	-1.01	-0.75	-0.62	0.00	3.29	-3.54	-0.69	0.83	0.12	-0.02	-4.45
28	-3.84	-1.05	-0.64	-0.61	-0.90	-0.65	-0.57	0.00	2.66	-2.95	-0.05	0.23	0.11	-0.01	-4.08
29	-1.72	-0.18	-0.09	-0.23	-0.08	0.02	-0.22	0.00	-1.65	1.55	1.34	-1.17	-0.07	0.00	-1.79
30	5.73	2.63	1.41	1.16	2.47	1.75	1.22	0.00	1.68	-3.15	8.48	-7.46	0.07	0.10	6.35
31	-3.71	-1.00	-0.60	-0.60	-0.86	-0.58	-0.58	0.00	0.73	-1.02	0.50	-0.29	0.04	0.00	-3.94
32	-4.53	-1.37	-0.88	-0.72	-1.25	-0.95	-0.66	0.00	3.69	-3.97	-0.37	0.49	0.14	-0.01	-4.83
33	-4.19	-1.25	-0.79	-0.67	-1.13	-0.84	-0.63	0.00	2.96	-3.20	0.04	0.10	0.12	0.00	-4.46
34	-4.04	-1.11	-0.65	-0.67	-0.96	-0.63	-0.66	0.00	-1.49	1.21	0.82	-0.60	-0.04	0.00	-4.30
35	-1.63	-0.07	-0.03	-0.20	0.04	0.06	-0.12	0.00	-0.30	0.14	1.14	-0.95	-0.01	0.00	-1.69
36	-4.09	-1.22	-0.75	-0.67	-1.10	-0.78	-0.65	0.00	0.96	-1.29	0.82	-0.61	0.05	0.01	-4.36
37	-2.61	-0.74	-0.55	-0.35	-0.68	-0.55	-0.37	0.00	1.90	-1.95	3.03	-3.04	0.06	0.06	-2.76
38	-2.91	-0.85	-0.57	-0.43	-0.78	-0.59	-0.42	0.00	2.93	-2.93	1.32	-1.31	0.11	0.03	-3.09
39	-4.97	-1.42	-0.81	-0.84	-1.24	-0.81	-0.83	0.00	-2.58	2.26	0.93	-0.67	-0.07	0.01	-5.30
40	-4.44	-1.34	-0.80	-0.75	-1.21	-0.82	-0.74	0.00	-1.30	0.81	1.33	-1.02	-0.02	0.02	-4.74
41	-2.63	-0.77	-0.51	-0.41	-0.70	-0.51	-0.42	0.00	0.87	-1.18	2.47	-2.27	0.05	0.05	-2.79
42	1.45	0.60	0.18	0.35	0.61	0.38	0.14	0.00	0.67	0.04	7.78	-8.12	0.00	0.15	1.66
43	0.73	0.30	0.07	0.16	0.32	0.18	0.05	0.00	-4.64	4.03	6.86	-6.56	-0.18	0.12	0.85
44	2.50	0.84	0.37	0.42	0.85	0.55	0.25	0.00	-5.73	5.19	8.28	-8.01	-0.23	0.14	2.79
45	-5.42	-1.67	-0.97	-0.94	-1.52	-1.01	-0.93	0.00	-2.56	2.07	1.22	-0.89	-0.06	0.02	-5.80
46	-2.80	-0.82	-0.52	-0.46	-0.75	-0.53	-0.47	0.00	-0.66	-0.15	3.45	-2.95	0.02	0.06	-2.98
47	-0.69	-0.17	-0.15	-0.10	-0.15	-0.14	-0.12	0.00	-0.33	-0.01	2.96	-2.76	0.00	0.05	-0.71
48	-0.11	-0.09	-0.02	-0.07	-0.09	-0.06	-0.03	0.00	-2.17	1.43	-0.49	0.85	-0.07	-0.02	-0.13
49	0.20	0.05	0.04	0.02	0.05	0.04	0.02	0.00	0.09	-0.15	-0.36	0.40	0.01	-0.01	0.02
50	-3.51	-1.03	-0.61	-0.58	-0.95	-0.64	-0.57	0.00	-0.84	0.05	3.51	-2.98	0.03	0.06	-3.75
51	-0.04	0.09	0.01	0.01	0.11	0.01	0.01	0.00	3.28	-3.37	3.40	-3.24	0.16	0.06	0.01
52	-0.05	-0.01	-0.02	-0.01	-0.01	-0.01	-0.01	0.00	-0.04	-0.04	0.58	-0.53	0.00	0.01	-0.04
53	2.64	0.98	0.45	0.52	1.00	0.58	0.39	0.00	1.33	-2.82	7.91	-6.92	0.12	0.13	2.92
54	3.18	1.12	0.56	0.55	1.13	0.63	0.48	0.00	5.62	-5.38	3.84	-3.78	0.23	0.07	3.51
55	-0.29	-0.12	-0.07	-0.05	-0.11	-0.06	-0.06	0.00	-0.99	0.97	-0.69	0.67	-0.05	-0.01	-0.31
56	0.15	0.02	0.03	0.00	0.02	0.00	0.03	0.00	1.49	-0.72	-2.29	1.87	0.03	-0.03	0.24



## ANALİZ SONUÇLARI

Nokta no	dx cm	dy cm	X m	Y m	Z m	Mxalt (tm)	Mxust (tm)	Myalt (tm)	Myust (tm)	Asax cm <sup>2</sup>	Asux cm <sup>2</sup>	Asay cm <sup>2</sup>	Asuy cm <sup>2</sup>
1	40	40	-0.600	-0.850	0.000	4.29	-5.86	1.60	-1.12	4.40	6.03	3.50	3.50
2	40	40	0.520	-0.850	0.000	4.20	-7.09	2.39	-2.04	4.31	7.32	3.50	3.50
3	40	40	1.550	-0.850	0.000	2.41	-7.24	0.89	-0.84	3.50	7.47	3.50	3.50
4	40	40	-0.600	0.189	0.000	0.52	-0.51	5.43	-3.61	3.50	3.50	5.58	3.70
5	40	40	0.100	0.000	0.000	3.39	-3.93	5.55	-4.03	3.50	4.03	5.71	4.13
6	40	40	0.520	0.189	0.000	5.19	-8.54	2.70	-1.91	5.34	8.84	3.50	3.50
7	40	40	1.550	0.189	0.000	2.02	-6.87	2.78	-2.11	3.50	7.09	3.50	3.50
8	40	40	2.625	-0.850	0.000	4.06	-6.43	3.91	-3.21	4.17	6.63	4.01	3.50
9	40	40	-0.600	1.228	0.000	6.55	-4.37	6.42	-1.09	6.75	4.48	6.61	3.50
10	40	40	0.475	1.228	0.000	4.89	-7.04	5.22	-2.31	5.02	7.27	5.36	3.50
11	40	40	1.550	1.228	0.000	1.54	-6.61	3.07	-1.43	3.50	6.82	3.50	3.50
12	40	40	2.625	0.189	0.000	3.55	-6.47	3.90	-2.93	3.64	6.67	4.00	3.50
13	40	40	3.920	-0.850	0.000	1.43	-3.14	5.19	-4.81	3.50	3.50	5.33	4.94
14	40	40	3.500	0.000	0.000	2.57	-4.08	5.82	-4.76	3.50	4.18	6.00	4.89
15	40	40	-0.600	2.267	0.000	4.65	-2.17	8.09	-1.48	4.77	3.50	8.37	3.50
16	40	40	0.100	2.200	0.000	4.89	-3.45	7.78	-1.82	5.03	3.54	8.05	3.50
17	40	40	0.475	2.267	0.000	6.27	-6.37	7.63	-2.80	6.46	6.56	7.89	3.50
18	40	40	2.625	1.228	0.000	4.12	-4.72	7.58	-3.13	4.23	4.85	7.83	3.50
19	40	40	1.550	2.267	0.000	1.98	-6.75	5.45	-2.61	3.50	6.96	5.61	3.50
20	40	40	3.920	0.189	0.000	0.92	-1.22	6.17	-5.19	3.50	3.50	6.35	5.33
21	40	40	-0.600	3.306	0.000	0.79	-1.58	2.66	-3.84	3.50	3.50	3.50	3.94
22	40	40	0.475	3.306	0.000	2.49	-4.58	2.43	-4.00	3.50	4.71	3.50	4.10
23	40	40	2.625	2.267	0.000	3.39	-5.64	7.84	-3.62	3.50	5.80	8.11	3.71
24	40	40	3.920	1.228	0.000	1.83	-2.59	9.04	-4.61	3.50	3.50	9.37	4.74
25	40	40	3.500	2.200	0.000	3.49	-4.87	9.64	-3.56	3.57	5.01	10.01	3.65
26	40	40	1.550	3.306	0.000	0.46	-4.85	0.99	-3.84	3.50	4.98	3.50	3.94
27	40	40	-0.600	4.344	0.000	0.11	-1.26	0.00	-7.04	3.50	3.50	3.50	7.27
28	40	40	0.475	4.344	0.000	0.46	-2.74	0.05	-7.16	3.50	3.50	3.50	7.39
29	40	40	2.625	3.306	0.000	0.13	-4.08	1.63	-4.07	3.50	4.19	3.50	4.18
30	40	40	3.920	2.267	0.000	1.85	-1.59	6.93	-2.87	3.50	3.50	7.16	3.50
31	40	40	1.550	4.344	0.000	0.00	-3.81	0.01	-6.56	3.50	3.91	3.50	6.77
32	40	40	-0.600	5.383	0.000	0.17	-1.12	0.17	-8.45	3.50	3.50	3.50	8.75
33	40	40	0.475	5.383	0.000	0.36	-2.83	0.06	-8.14	3.50	3.50	3.50	8.42
34	40	40	2.625	4.344	0.000	0.00	-3.28	0.02	-7.08	3.50	3.50	3.50	7.31
35	40	40	3.700	3.306	0.000	1.07	-2.09	4.24	-4.78	3.50	3.50	4.35	4.91
36	40	40	1.550	5.383	0.000	0.00	-3.84	0.02	-7.47	3.50	3.94	3.50	7.72
37	40	40	-0.600	6.422	0.000	0.78	-1.72	2.80	-7.44	3.50	3.50	3.50	7.69
38	40	40	0.475	6.422	0.000	2.43	-4.99	2.25	-6.29	3.50	5.13	3.50	6.48
39	40	40	3.700	4.344	0.000	0.10	-1.64	0.00	-7.47	3.50	3.50	3.50	7.72
40	40	40	2.625	5.383	0.000	0.01	-3.23	0.19	-8.16	3.50	3.50	3.50	8.45
41	40	40	1.550	6.422	0.000	0.37	-4.97	0.74	-6.23	3.50	5.10	3.50	6.42
42	40	40	-0.600	7.461	0.000	6.21	-3.71	10.90	-6.42	6.40	3.80	11.35	6.62
43	40	40	0.520	7.461	0.000	5.53	-7.08	4.56	-4.59	5.69	7.31	4.69	4.72
44	40	40	0.100	7.650	0.000	5.10	-4.29	7.95	-5.35	5.25	4.40	8.22	5.51
45	40	40	3.700	5.383	0.000	0.00	-2.04	0.09	-8.98	3.50	3.50	3.50	9.30
46	40	40	2.625	6.422	0.000	0.10	-4.32	0.97	-6.56	3.50	4.44	3.50	6.77
47	40	40	1.550	7.461	0.000	1.54	-6.54	2.87	-4.00	3.50	6.74	3.50	4.10
48	40	40	-0.600	8.500	0.000	3.79	-4.33	1.36	-1.30	3.88	4.44	3.50	3.50
49	40	40	0.520	8.500	0.000	4.84	-5.26	3.72	-2.32	4.97	5.41	3.81	3.50
50	40	40	3.700	6.422	0.000	0.35	-2.38	4.28	-6.89	3.50	3.50	4.39	7.11
51	40	40	2.625	7.461	0.000	2.94	-5.46	4.12	-2.86	3.50	5.62	4.22	3.50
52	40	40	1.550	8.500	0.000	1.92	-6.06	1.06	-1.52	3.50	6.24	3.50	3.50
53	40	40	3.920	7.461	0.000	3.18	-2.24	6.08	-4.63	3.50	3.50	6.26	4.75
54	40	40	3.500	7.650	0.000	3.39	-2.43	6.17	-2.96	3.50	3.50	6.36	3.50
55	40	40	2.625	8.500	0.000	3.76	-4.97	3.73	-1.60	3.85	5.11	3.82	3.50
56	40	40	3.920	8.500	0.000	4.19	-3.24	4.38	-2.10	4.30	3.50	4.49	3.50

Noktaların tasarım momentleri, bağlı düğüm noktalarının tasarım momentlerinin ortalaması alınmıştır.

## TEMEL DONATI SONUÇLARI

Genel donatılar:

H cm	X üst	X alt	Y üst	Y alt
40	ø14 / 15	ø14 / 15	ø14 / 15	ø14 / 15

Donatı Asal açısı=0°

## WINKLER YAY YÜKLERİ (t)

Nokta no	1 g	2 q	3 q	4 q	5 q	6 q	7 q	8 s	9 e	10 e	11 e	12 e	13 w	14 w	17 Ez
1	0.70	0.43	0.41	0.38	0.38	0.40	0.39	0.00	-0.95	0.98	-0.59	0.58	-0.03	-0.01	0.51
2	1.53	0.93	0.85	0.81	0.82	0.84	0.85	0.00	-1.07	1.12	-1.26	1.23	-0.03	-0.02	1.15
3	1.99	1.19	1.07	1.03	1.05	1.04	1.09	0.00	-0.13	0.14	-1.57	1.52	0.00	-0.02	1.53
4	0.59	0.38	0.36	0.33	0.34	0.36	0.33	0.00	-0.81	0.84	-0.36	0.36	-0.03	0.00	0.44
5	1.94	1.23	1.12	1.05	1.10	1.12	1.08	0.00	-1.86	1.92	-1.28	1.25	-0.06	-0.02	1.44
6	2.78	1.77	1.60	1.51	1.58	1.60	1.55	0.00	-1.97	2.04	-1.68	1.64	-0.06	-0.02	2.08
7	3.94	2.46	2.17	2.09	2.20	2.16	2.17	0.00	-0.25	0.26	-2.26	2.20	-0.01	-0.03	3.02
8	2.11	1.22	1.05	1.04	1.06	1.02	1.10	0.00	1.13	-1.17	-1.57	1.53	0.04	-0.02	1.67
9	1.69	1.15	1.05	0.96	1.06	1.09	0.97	0.00	-2.37	2.44	-0.51	0.50	-0.08	-0.01	1.23
10	3.14	2.10	1.88	1.76	1.93	1.92	1.79	0.00	-2.32	2.40	-1.02	0.99	-0.08	-0.01	2.34
11	3.87	2.53	2.20	2.11	2.31	2.24	2.17	0.00	-0.23	0.22	-1.28	1.26	-0.01	-0.02	2.95
12	3.07	1.85	1.58	1.55	1.65	1.56	1.62	0.00	1.68	-1.74	-1.71	1.67	0.06	-0.02	2.44
13	0.86	0.47	0.39	0.40	0.41	0.38	0.42	0.00	0.91	-0.94	-0.61	0.59	0.03	-0.01	0.72
14	2.88	1.65	1.38	1.38	1.46	1.35	1.45	0.00	2.64	-2.73	-1.71	1.65	0.09	-0.02	2.36
15	0.54	0.39	0.36	0.33	0.37	0.38	0.32	0.00	-0.79	0.81	0.01	-0.01	-0.03	0.00	0.39
16	1.74	1.23	1.10	1.02	1.15	1.15	1.02	0.00	-1.74	1.79	-0.07	0.07	-0.06	0.00	1.26
17	2.52	1.78	1.58	1.48	1.67	1.64	1.48	0.00	-1.93	1.99	-0.13	0.12	-0.07	0.00	1.84
18	4.56	2.87	2.42	2.37	2.61	2.44	2.45	0.00	2.54	-2.66	-1.49	1.48	0.09	-0.02	3.61
19	3.68	2.54	2.21	2.11	2.37	2.26	2.14	0.00	-0.21	0.20	-0.36	0.36	-0.01	0.00	2.76
20	1.36	0.78	0.64	0.64	0.69	0.63	0.68	0.00	1.45	-1.49	-0.76	0.74	0.05	-0.01	1.13
21	1.52	1.19	1.09	0.99	1.14	1.15	0.97	0.00	-2.39	2.45	0.48	-0.48	-0.08	0.01	1.02
22	2.95	2.23	1.99	1.87	2.13	2.08	1.85	0.00	-2.33	2.39	0.62	-0.61	-0.08	0.01	2.05
23	2.85	1.88	1.59	1.55	1.75	1.61	1.59	0.00	1.66	-1.75	-0.33	0.34	0.06	0.00	2.23
24	2.02	1.20	0.98	0.98	1.09	0.98	1.02	0.00	2.20	-2.29	-0.65	0.65	0.07	-0.01	1.68
25	2.59	1.63	1.34	1.32	1.51	1.36	1.37	0.00	2.51	-2.63	-0.32	0.35	0.09	-0.01	2.10
26	3.40	2.49	2.16	2.07	2.37	2.24	2.08	0.00	-0.19	0.18	0.42	-0.40	-0.01	0.01	2.46
27	1.35	1.13	1.04	0.96	1.10	1.10	0.93	0.00	-2.31	2.35	0.92	-0.92	-0.08	0.02	0.85
28	2.92	2.34	2.09	1.98	2.27	2.19	1.94	0.00	-2.43	2.49	1.46	-1.44	-0.09	0.02	1.94
29	3.87	2.70	2.29	2.23	2.57	2.34	2.27	0.00	2.31	-2.40	0.23	-0.20	0.08	0.00	2.93
30	1.08	0.67	0.54	0.54	0.62	0.55	0.56	0.00	1.21	-1.26	-0.13	0.15	0.04	0.00	0.89
31	3.16	2.43	2.12	2.05	2.35	2.19	2.03	0.00	-0.18	0.19	1.11	-1.09	-0.01	0.02	2.21
32	1.31	1.12	1.02	0.96	1.11	1.09	0.91	0.00	-2.35	2.39	1.38	-1.38	-0.08	0.02	0.81
33	2.86	2.32	2.07	1.98	2.29	2.17	1.92	0.00	-2.50	2.56	2.23	-2.22	-0.09	0.04	1.87
34	3.47	2.54	2.16	2.12	2.46	2.21	2.13	0.00	2.13	-2.18	0.81	-0.78	0.07	0.01	2.54
35	1.80	1.20	0.98	0.98	1.13	1.00	1.00	0.00	1.98	-2.06	0.02	0.00	0.07	0.00	1.43
36	3.10	2.41	2.10	2.04	2.37	2.18	2.01	0.00	-0.23	0.26	1.75	-1.73	-0.01	0.03	2.14
37	1.34	1.10	0.99	0.94	1.10	1.05	0.88	0.00	-2.38	2.43	1.76	-1.76	-0.09	0.03	0.86
38	3.07	2.42	2.14	2.06	2.42	2.24	1.97	0.00	-2.79	2.88	3.05	-3.05	-0.11	0.05	2.07
39	1.91	1.33	1.11	1.10	1.29	1.12	1.12	0.00	2.22	-2.28	0.28	-0.26	0.08	0.00	1.46
40	3.40	2.52	2.14	2.12	2.47	2.20	2.10	0.00	2.10	-2.09	1.34	-1.33	0.07	0.02	2.47
41	3.21	2.43	2.10	2.06	2.43	2.18	2.00	0.00	-0.33	0.42	2.30	-2.31	-0.02	0.04	2.26
42	0.96	0.74	0.65	0.63	0.75	0.70	0.58	0.00	-1.66	1.70	1.37	-1.37	-0.06	0.02	0.66
43	1.91	1.42	1.24	1.20	1.44	1.30	1.14	0.00	-1.75	1.81	2.07	-2.08	-0.07	0.03	1.35
44	1.68	1.25	1.10	1.06	1.28	1.16	0.99	0.00	-2.06	2.11	2.06	-2.06	-0.08	0.03	1.19
45	1.86	1.32	1.10	1.10	1.30	1.11	1.10	0.00	2.22	-2.24	0.51	-0.49	0.08	0.01	1.41
46	3.54	2.56	2.16	2.14	2.55	2.22	2.11	0.00	2.13	-2.04	1.77	-1.79	0.07	0.03	2.61
47	3.41	2.47	2.12	2.08	2.50	2.20	2.00	0.00	-0.49	0.65	2.67	-2.71	-0.03	0.04	2.49
48	0.63	0.46	0.40	0.39	0.47	0.43	0.36	0.00	-1.08	1.10	0.91	-0.90	-0.04	0.01	0.45
49	1.39	0.99	0.86	0.83	1.01	0.90	0.78	0.00	-1.30	1.35	1.53	-1.54	-0.05	0.02	1.01
50	2.17	1.49	1.23	1.23	1.48	1.25	1.23	0.00	2.53	-2.48	0.76	-0.77	0.09	0.01	1.67
51	3.24	2.24	1.88	1.87	2.26	1.92	1.82	0.00	1.87	-1.67	1.70	-1.77	0.06	0.03	2.47
52	1.82	1.26	1.07	1.06	1.29	1.11	1.01	0.00	-0.33	0.45	1.44	-1.48	-0.02	0.02	1.36
53	0.44	0.29	0.23	0.24	0.29	0.24	0.23	0.00	0.53	-0.50	0.14	-0.15	0.02	0.00	0.36
54	2.44	1.60	1.31	1.32	1.62	1.33	1.30	0.00	2.48	-2.31	0.88	-0.94	0.08	0.01	1.94
55	1.93	1.28	1.07	1.07	1.31	1.09	1.03	0.00	1.02	-0.84	0.96	-1.04	0.03	0.01	1.50
56	0.79	0.50	0.40	0.41	0.51	0.41	0.40	0.00	0.90	-0.82	0.19	-0.22	0.03	0.00	0.65

## LOADS CHECK

DEAD LOADS CHECK

Wg=85.53 (t) (G JOINT LOADS) +40.21 (DEAD LOAD) =126.87 (t) (G WINKLER SPRING REACTION)

LIVE LOADS CHECK

Wq=26.12 (t) (Q JOINT LOADS) +60.31 (LIVE LOAD) =88.14 (t) (Q WINKLER SPRING REACTION)

LİSANS : ONAT MUS.PROJE MUH.LTD.STİ.



FİRMA : ONAT MUS.PROJE MUH.LTD.STI.

31-12-2025

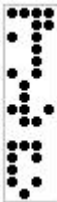
SAYFA: 50

PROJE : YANGIN MERDİVENİ

(SAKARYA MİSAFİRHANE YANGIN MERDİVENİ\_R2.ST4)

ZEMİN GERİLMESİ t/m<sup>2</sup>

Nokta no	1 g	2 q	3 q	4 q	5 q	6 q	7 q	8 s	9 e	10 e	11 e	12 e	13 w	14 w	17 Ez	max. σ
1	3.328	2.057	1.935	1.791	1.800	1.905	1.861	0.00	-4.52	4.68	-2.82	2.76	-0.14	-0.03	2.44	10.793
2	3.463	2.112	1.935	1.837	1.849	1.895	1.922	0.00	-2.43	2.54	-2.86	2.78	-0.08	-0.03	2.60	9.216
3	3.644	2.183	1.948	1.890	1.913	1.901	1.988	0.00	-0.24	0.26	-2.87	2.79	-0.01	-0.04	2.80	9.537
4	3.268	2.113	1.958	1.799	1.892	1.976	1.839	0.00	-4.47	4.60	-2.01	1.98	-0.14	-0.02	2.39	10.701
5	3.369	2.136	1.953	1.827	1.904	1.953	1.883	0.00	-3.23	3.34	-2.22	2.17	-0.10	-0.03	2.51	9.595
6	3.404	2.167	1.957	1.846	1.940	1.962	1.902	0.00	-2.41	2.50	-2.06	2.01	-0.08	-0.03	2.55	8.834
7	3.583	2.238	1.971	1.900	2.004	1.964	1.972	0.00	-0.23	0.23	-2.05	2.00	-0.01	-0.03	2.75	8.698
8	3.970	2.294	1.988	1.964	2.006	1.928	2.081	0.00	2.12	-2.21	-2.97	2.88	0.07	-0.04	3.16	10.179
9	3.169	2.162	1.977	1.804	1.980	2.041	1.812	0.00	-4.44	4.57	-0.96	0.94	-0.15	-0.01	2.30	10.595
10	3.300	2.210	1.974	1.848	2.023	2.021	1.875	0.00	-2.44	2.52	-1.07	1.04	-0.08	-0.01	2.45	8.761
11	3.479	2.277	1.984	1.902	2.083	2.013	1.950	0.00	-0.20	0.20	-1.16	1.14	-0.01	-0.01	2.65	8.513
12	3.911	2.351	2.009	1.976	2.099	1.990	2.068	0.00	2.13	-2.22	-2.18	2.12	0.07	-0.03	3.11	9.414
13	4.490	2.462	2.056	2.069	2.143	1.978	2.212	0.00	4.72	-4.89	-3.18	3.08	0.16	-0.04	3.73	12.957
14	4.278	2.454	2.051	2.045	2.175	2.012	2.160	0.00	3.93	-4.06	-2.54	2.46	0.13	-0.03	3.51	11.842
15	2.994	2.167	1.970	1.791	2.028	2.066	1.771	0.00	-4.32	4.45	0.04	-0.05	-0.14	0.00	2.13	10.250
16	3.117	2.206	1.975	1.824	2.060	2.056	1.820	0.00	-3.11	3.21	-0.13	0.12	-0.11	0.00	2.26	9.215
17	3.136	2.216	1.969	1.836	2.071	2.044	1.838	0.00	-2.40	2.48	-0.16	0.15	-0.08	0.00	2.29	8.518
18	3.811	2.396	2.025	1.982	2.185	2.040	2.051	0.00	2.12	-2.22	-1.25	1.24	0.07	-0.02	3.02	9.335
19	3.298	2.275	1.975	1.888	2.124	2.028	1.914	0.00	-0.19	0.18	-0.32	0.32	-0.01	0.00	2.47	8.258
20	4.435	2.521	2.077	2.083	2.240	2.041	2.201	0.00	4.70	-4.85	-2.48	2.40	0.15	-0.03	3.68	12.912
21	2.675	2.097	1.915	1.753	2.004	2.022	1.711	0.00	-4.21	4.31	0.85	-0.85	-0.14	0.02	1.79	9.625
22	2.847	2.155	1.922	1.802	2.055	2.008	1.784	0.00	-2.26	2.31	0.60	-0.59	-0.08	0.01	1.98	7.909
23	3.631	2.398	2.018	1.969	2.232	2.055	2.019	0.00	2.11	-2.22	-0.41	0.44	0.07	-0.01	2.83	9.101
24	4.347	2.582	2.100	2.098	2.345	2.103	2.193	0.00	4.73	-4.93	-1.40	1.39	0.16	-0.02	3.60	12.940
25	4.027	2.538	2.077	2.054	2.352	2.105	2.125	0.00	3.90	-4.09	-0.50	0.54	0.13	-0.01	3.27	11.633
26	3.045	2.227	1.938	1.858	2.119	2.002	1.864	0.00	-0.17	0.16	0.38	-0.36	-0.01	0.01	2.20	7.826
27	2.414	2.025	1.857	1.723	1.974	1.968	1.660	0.00	-4.13	4.22	1.65	-1.64	-0.14	0.03	1.52	9.111
28	2.617	2.095	1.875	1.776	2.036	1.963	1.737	0.00	-2.18	2.23	1.30	-1.29	-0.08	0.02	1.74	7.462
29	3.346	2.338	1.978	1.932	2.219	2.024	1.963	0.00	1.99	-2.08	0.20	-0.17	0.07	0.00	2.53	8.523
30	4.176	2.595	2.100	2.089	2.406	2.124	2.167	0.00	4.66	-4.87	-0.52	0.56	0.16	-0.01	3.43	12.673
31	2.834	2.172	1.898	1.832	2.106	1.965	1.818	0.00	-0.16	0.17	0.99	-0.97	-0.01	0.02	1.98	7.443
32	2.349	2.006	1.831	1.724	1.990	1.946	1.638	0.00	-4.20	4.29	2.47	-2.46	-0.15	0.04	1.45	9.075
33	2.557	2.078	1.854	1.775	2.054	1.945	1.716	0.00	-2.24	2.29	2.00	-1.99	-0.08	0.03	1.68	7.431
34	3.107	2.274	1.935	1.899	2.198	1.983	1.910	0.00	1.91	-1.95	0.73	-0.70	0.06	0.01	2.28	8.018
35	3.720	2.478	2.034	2.017	2.344	2.065	2.073	0.00	4.10	-4.25	0.04	0.01	0.14	0.00	2.94	11.334
36	2.774	2.156	1.881	1.829	2.125	1.949	1.796	0.00	-0.20	0.24	1.56	-1.55	-0.01	0.02	1.92	7.333
37	2.495	2.050	1.846	1.758	2.063	1.968	1.647	0.00	-4.45	4.54	3.30	-3.29	-0.16	0.05	1.61	9.582
38	2.684	2.115	1.869	1.804	2.121	1.963	1.723	0.00	-2.44	2.52	2.67	-2.67	-0.09	0.04	1.81	8.020
39	3.416	2.391	1.980	1.972	2.305	2.012	2.007	0.00	3.98	-4.08	0.50	-0.46	0.14	0.01	2.62	10.671
40	3.041	2.254	1.918	1.894	2.216	1.966	1.885	0.00	1.88	-1.87	1.20	-1.19	0.06	0.02	2.21	7.865
41	2.887	2.188	1.894	1.855	2.188	1.964	1.801	0.00	-0.30	0.38	2.07	-2.08	-0.02	0.03	2.03	7.764
42	2.762	2.128	1.887	1.809	2.166	2.015	1.673	0.00	-4.80	4.90	3.96	-3.96	-0.18	0.06	1.89	10.394
43	2.930	2.186	1.906	1.850	2.217	2.002	1.749	0.00	-2.69	2.78	3.19	-3.19	-0.10	0.05	2.08	8.964
44	2.924	2.179	1.908	1.844	2.218	2.017	1.726	0.00	-3.58	3.67	3.57	-3.57	-0.14	0.06	2.07	9.435
45	3.337	2.365	1.961	1.965	2.320	1.993	1.978	0.00	3.98	-4.01	0.91	-0.88	0.14	0.01	2.53	10.466
46	3.169	2.291	1.936	1.921	2.284	1.985	1.892	0.00	1.91	-1.82	1.59	-1.60	0.06	0.02	2.34	8.103
47	3.101	2.248	1.927	1.895	2.274	1.997	1.822	0.00	-0.45	0.59	2.43	-2.47	-0.03	0.04	2.26	8.522
48	2.992	2.188	1.924	1.849	2.251	2.051	1.697	0.00	-5.17	5.25	4.31	-4.31	-0.19	0.07	2.13	11.131
49	3.146	2.242	1.940	1.888	2.298	2.035	1.770	0.00	-2.95	3.07	3.47	-3.49	-0.12	0.05	2.30	9.627
50	3.507	2.416	1.987	2.000	2.403	2.020	1.991	0.00	4.09	-4.02	1.23	-1.24	0.14	0.02	2.71	10.828
51	3.410	2.360	1.974	1.966	2.381	2.023	1.918	0.00	1.96	-1.76	1.79	-1.86	0.06	0.03	2.60	8.584
52	3.321	2.306	1.962	1.934	2.358	2.030	1.845	0.00	-0.61	0.82	2.63	-2.70	-0.04	0.04	2.49	9.130
53	3.890	2.530	2.047	2.074	2.545	2.078	2.047	0.00	4.64	-4.42	1.21	-1.29	0.15	0.02	3.12	12.016
54	3.791	2.491	2.033	2.049	2.512	2.069	2.012	0.00	3.85	-3.58	1.36	-1.47	0.12	0.02	3.01	11.052
55	3.639	2.421	2.010	2.008	2.468	2.057	1.943	0.00	1.93	-1.59	1.81	-1.95	0.05	0.03	2.84	9.044
56	4.125	2.589	2.083	2.116	2.631	2.112	2.072	0.00	4.70	-4.27	0.97	-1.17	0.15	0.01	3.36	12.466

max ZEMİN GERİLMESİ=12.957 t/m<sup>2</sup>

FİRMA : ONAT MUS.PROJE MUH.LTD.STI.

31-12-2025

SAYFA: 51

PROJE : YANGIN MERDİVENİ

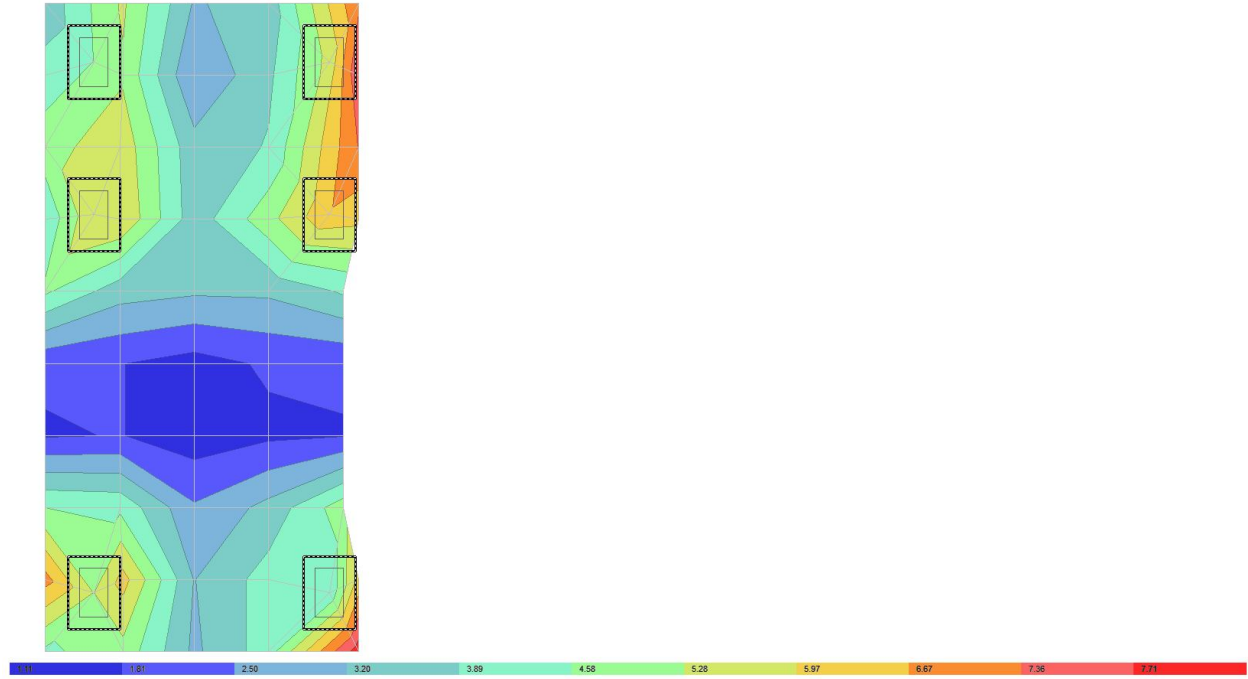
(SAKARYA MİSAFİRHANE YANGIN MERDİVENİ\_R2.ST4)

## NOKTA DEPLASMANLARI mm

Nokta no	1 g	2 q	3 q	4 q	5 q	6 q	7 q	8 s	9 e	10 e	11 e	12 e	13 w	14 w	17 Ez
1	3.962	2.449	2.304	2.132	2.143	2.268	2.216	0.000	-5.377	5.565	-3.360	3.284	-0.170	-0.040	2.907
2	4.123	2.515	2.303	2.187	2.202	2.256	2.288	0.000	-2.890	3.019	-3.407	3.309	-0.094	-0.041	3.092
3	4.338	2.599	2.320	2.250	2.277	2.263	2.367	0.000	-0.288	0.313	-3.416	3.317	-0.007	-0.043	3.333
4	3.890	2.516	2.331	2.142	2.252	2.352	2.189	0.000	-5.327	5.478	-2.388	2.352	-0.169	-0.029	2.849
5	4.011	2.543	2.325	2.175	2.266	2.325	2.241	0.000	-3.844	3.973	-2.643	2.584	-0.124	-0.032	2.983
6	4.052	2.580	2.329	2.198	2.309	2.336	2.265	0.000	-2.873	2.974	-2.448	2.389	-0.094	-0.030	3.035
7	4.266	2.665	2.346	2.262	2.386	2.338	2.348	0.000	-0.269	0.278	-2.442	2.381	-0.007	-0.031	3.274
8	4.726	2.732	2.366	2.338	2.388	2.296	2.477	0.000	2.529	-2.625	-3.533	3.432	0.088	-0.045	3.759
9	3.773	2.574	2.354	2.148	2.358	2.429	2.157	0.000	-5.284	5.444	-1.139	1.115	-0.173	-0.012	2.741
10	3.928	2.631	2.350	2.200	2.408	2.405	2.232	0.000	-2.900	2.995	-1.271	1.239	-0.097	-0.015	2.919
11	4.141	2.711	2.362	2.265	2.479	2.397	2.321	0.000	-0.243	0.237	-1.376	1.351	-0.007	-0.017	3.156
12	4.656	2.799	2.392	2.352	2.499	2.369	2.462	0.000	2.541	-2.641	-2.589	2.526	0.088	-0.034	3.702
13	5.346	2.931	2.448	2.463	2.552	2.355	2.634	0.000	5.620	-5.817	-3.790	3.666	0.186	-0.050	4.436
14	5.093	2.922	2.441	2.435	2.589	2.395	2.571	0.000	4.673	-4.830	-3.020	2.928	0.156	-0.041	4.176
15	3.564	2.580	2.345	2.132	2.415	2.459	2.108	0.000	-5.147	5.298	0.052	-0.063	-0.171	0.005	2.534
16	3.710	2.627	2.351	2.171	2.452	2.448	2.166	0.000	-3.706	3.825	-0.157	0.142	-0.126	0.001	2.696
17	3.733	2.638	2.344	2.186	2.466	2.433	2.189	0.000	-2.862	2.952	-0.186	0.174	-0.099	0.000	2.724
18	4.537	2.852	2.411	2.360	2.601	2.429	2.442	0.000	2.524	-2.647	-1.486	1.474	0.088	-0.021	3.590
19	3.926	2.709	2.351	2.248	2.528	2.414	2.278	0.000	-0.226	0.213	-0.381	0.385	-0.008	-0.004	2.938
20	5.280	3.002	2.473	2.480	2.667	2.430	2.620	0.000	5.598	-5.775	-2.948	2.852	0.184	-0.041	4.385
21	3.185	2.496	2.279	2.087	2.386	2.408	2.037	0.000	-5.014	5.136	1.016	-1.009	-0.171	0.019	2.136
22	3.389	2.566	2.289	2.145	2.447	2.390	2.123	0.000	-2.686	2.752	0.710	-0.701	-0.093	0.013	2.362
23	4.323	2.854	2.403	2.344	2.657	2.447	2.404	0.000	2.513	-2.645	-0.493	0.521	0.088	-0.008	3.373
24	5.175	3.074	2.500	2.498	2.792	2.503	2.611	0.000	5.629	-5.868	-1.667	1.658	0.189	-0.025	4.290
25	4.794	3.021	2.473	2.445	2.800	2.505	2.530	0.000	4.640	-4.867	-0.599	0.645	0.160	-0.011	3.889
26	3.625	2.651	2.307	2.212	2.523	2.383	2.219	0.000	-0.198	0.187	0.448	-0.427	-0.008	0.008	2.622
27	2.874	2.411	2.210	2.052	2.350	2.343	1.976	0.000	-4.916	5.019	1.969	-1.953	-0.172	0.033	1.808
28	3.116	2.494	2.232	2.114	2.424	2.337	2.068	0.000	-2.594	2.653	1.552	-1.535	-0.092	0.026	2.073
29	3.984	2.784	2.355	2.299	2.642	2.409	2.336	0.000	2.375	-2.474	0.239	-0.201	0.082	0.003	3.016
30	4.972	3.090	2.500	2.486	2.864	2.528	2.580	0.000	5.545	-5.800	-0.617	0.666	0.188	-0.012	4.085
31	3.373	2.586	2.260	2.180	2.507	2.339	2.165	0.000	-0.193	0.199	1.180	-1.157	-0.009	0.019	2.355
32	2.796	2.389	2.180	2.053	2.369	2.317	1.950	0.000	-5.004	5.102	2.946	-2.932	-0.179	0.049	1.726
33	3.043	2.474	2.208	2.113	2.445	2.316	2.043	0.000	-2.661	2.730	2.380	-2.367	-0.098	0.039	1.997
34	3.699	2.707	2.303	2.260	2.617	2.360	2.273	0.000	2.272	-2.325	0.867	-0.833	0.077	0.012	2.713
35	4.429	2.950	2.422	2.401	2.791	2.459	2.468	0.000	4.880	-5.063	0.047	0.007	0.167	-0.002	3.505
36	3.303	2.566	2.239	2.178	2.530	2.320	2.138	0.000	-0.241	0.282	1.861	-1.848	-0.013	0.029	2.280
37	2.970	2.441	2.198	2.093	2.456	2.343	1.960	0.000	-5.300	5.407	3.924	-3.916	-0.194	0.064	1.914
38	3.195	2.518	2.225	2.148	2.525	2.337	2.051	0.000	-2.906	2.998	3.180	-3.178	-0.110	0.051	2.158
39	4.067	2.846	2.357	2.348	2.744	2.395	2.390	0.000	4.740	-4.856	0.596	-0.548	0.163	0.006	3.116
40	3.621	2.684	2.283	2.255	2.638	2.341	2.244	0.000	2.243	-2.232	1.429	-1.413	0.075	0.021	2.628
41	3.437	2.605	2.255	2.208	2.604	2.338	2.144	0.000	-0.356	0.452	2.464	-2.474	-0.020	0.039	2.422
42	3.289	2.533	2.246	2.153	2.578	2.399	1.992	0.000	-5.716	5.831	4.715	-4.714	-0.213	0.076	2.253
43	3.488	2.602	2.269	2.203	2.640	2.384	2.082	0.000	-3.197	3.308	3.793	-3.802	-0.125	0.060	2.471
44	3.481	2.594	2.271	2.195	2.640	2.401	2.055	0.000	-4.265	4.372	4.252	-4.255	-0.163	0.067	2.461
45	3.972	2.816	2.335	2.339	2.761	2.373	2.355	0.000	4.739	-4.768	1.079	-1.053	0.163	0.014	3.012
46	3.773	2.728	2.304	2.287	2.720	2.363	2.252	0.000	2.276	-2.172	1.887	-1.909	0.073	0.029	2.789
47	3.692	2.676	2.294	2.256	2.708	2.378	2.169	0.000	-0.534	0.701	2.895	-2.939	-0.031	0.045	2.692
48	3.562	2.604	2.291	2.201	2.679	2.441	2.020	0.000	-6.149	6.249	5.136	-5.129	-0.231	0.081	2.539
49	3.745	2.668	2.310	2.248	2.736	2.422	2.107	0.000	-3.516	3.651	4.136	-4.158	-0.140	0.064	2.739
50	4.175	2.876	2.365	2.381	2.860	2.404	2.370	0.000	4.872	-4.781	1.460	-1.478	0.165	0.021	3.227
51	4.060	2.810	2.350	2.341	2.834	2.408	2.284	0.000	2.336	-2.093	2.128	-2.216	0.070	0.033	3.092
52	3.953	2.746	2.336	2.302	2.807	2.417	2.196	0.000	-0.724	0.975	3.131	-3.219	-0.043	0.048	2.966
53	4.631	3.012	2.437	2.469	3.030	2.474	2.437	0.000	5.530	-5.262	1.437	-1.541	0.182	0.021	3.713
54	4.513	2.965	2.420	2.439	2.991	2.463	2.396	0.000	4.578	-4.263	1.620	-1.745	0.147	0.024	3.583
55	4.333	2.882	2.393	2.391	2.938	2.449	2.313	0.000	2.294	-1.893	2.155	-2.324	0.061	0.033	3.377
56	4.911	3.082	2.480	2.519	3.132	2.514	2.467	0.000	5.596	-5.084	1.160	-1.392	0.174	0.016	4.004

## RADYE TEMEL KOLON ZİMBALAMA HESABI

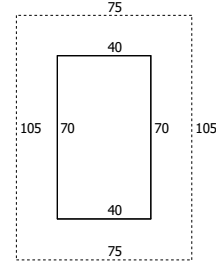
Deprem tesirleri, D=3 ile çarpılmaktadır.



SmaxV gerilmesi :7.76(kg/cm<sup>2</sup>) < fctd=13.79(kg/cm<sup>2</sup>)  
Maksimum zimbalama gerilmesi, fctd kesme dayanımından küçüktür.

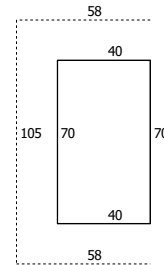
## S101

d= 35 cm    Ac =1.260m<sup>2</sup>     $\Phi_x=0, \Phi_y=0$   
Ex =10.00 cm    Ey = 0.00 cm  
Ix = 0.133328 m<sup>4</sup>    Iy = 0.219734 m<sup>4</sup>  
Up = 360.00 cm    fctd=137.94 t/m<sup>2</sup>  
Mx = 0.41 (tm)    My = 2.91 (tm)  
Xt= 37.5 cm    Yx=0.896    Yt= 52.5 cm    Yy=0.896  
Vd = 43.65/ 43.65 (t)    Vdq =4.7 (t) zemin  
Vp = Y · fctd · Up · d > Vd,    Vd = Vdc - Vdq  
Vxd=43.65 < Vp= 155.74 (t) ZİMBALAMA YETERLİ.  
Vyd=43.65 < Vp= 155.74 (t) ZİMBALAMA YETERLİ.



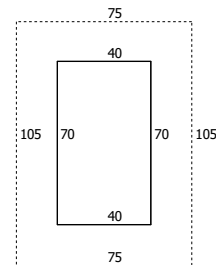
## S102

d= 35 cm    Ac =0.770m<sup>2</sup>     $\Phi_x=0, \Phi_y=0$   
Ex =-32.4 cm    Ey = 0.00 cm  
Ix = 0.031077 m<sup>4</sup>    Iy = 0.148455 m<sup>4</sup>  
Up = 220.00 cm    fctd=137.94 t/m<sup>2</sup>  
Mx = 0.50 (tm)    My = 3.42 (tm)  
Xt= 15.02 cm    Yx=0.863    Yt= 52.49 cm    Yy=0.863  
Vd = 43.55/ 43.55 (t)    Vdq =4.2 (t) zemin  
Vp = Y · fctd · Up · d > Vd,    Vd = Vdc - Vdq  
Vxd=43.55 < Vp= 91.70 (t) ZİMBALAMA YETERLİ.  
Vyd=43.55 < Vp= 91.70 (t) ZİMBALAMA YETERLİ.



## S103

d= 35 cm    Ac =1.260m<sup>2</sup>     $\Phi_x=0, \Phi_y=0$   
Ex =10.00 cm    Ey = 5.00 cm  
Ix = 0.133328 m<sup>4</sup>    Iy = 0.219734 m<sup>4</sup>  
Up = 360.00 cm    fctd=137.94 t/m<sup>2</sup>  
Mx = 4.83 (tm)    My = 0.39 (tm)  
Xt= 37.5 cm    Yx=0.894    Yt= 52.5 cm    Yy=0.894  
Vd = 69.59/ 69.59 (t)    Vdq =4.7 (t) zemin  
Vp = Y · fctd · Up · d > Vd,    Vd = Vdc - Vdq  
Vxd=69.59 < Vp= 155.38 (t) ZİMBALAMA YETERLİ.  
Vyd=69.59 < Vp= 155.38 (t) ZİMBALAMA YETERLİ.



FİRMA : ONAT MUS.PROJE MUH.LTD.STI.

31-12-2025

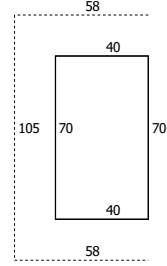
SAYFA: 53

PROJE : YANGIN MERDİVENİ

(SAKARYA MİSAFİRHANE YANGIN MERDİVENİ\_R2.ST4)

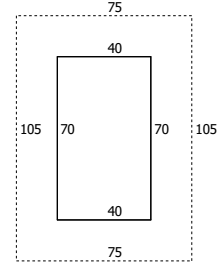
## S104

d= 35 cm     $A_c = 0.770\text{m}^2$      $\Phi_x=0, \Phi_y=0$   
Ex = -32.4 cm    Ey = 5.00 cm  
Ix = 0.031077 m<sup>4</sup>    Iy = 0.148455 m<sup>4</sup>  
Up = 220.00 cm    fctd=137.94 t/m<sup>2</sup>  
Mx = 4.50 (tm)    My = 2.16 (tm)  
Xt= 15.02 cm    Yx=0.863    Yt= 52.49 cm    Yy=0.863  
Vd = 76.84/ 76.84 (t)    Vdq =4.2 (t) zemin  
Vp = Y · fctd · Up · d > Vd,    Vd = Vdc - Vdq  
Vxd=76.84 < Vp= 91.67 (t) ZİMBALAMA YETERLİ.  
Vyd=76.84 < Vp= 91.67 (t) ZİMBALAMA YETERLİ.



## S105

d= 35 cm     $A_c = 1.260\text{m}^2$      $\Phi_x=0, \Phi_y=0$   
Ex =10.00 cm    Ey =-34.9 cm  
Ix = 0.133328 m<sup>4</sup>    Iy = 0.219734 m<sup>4</sup>  
Up = 360.00 cm    fctd=137.94 t/m<sup>2</sup>  
Mx = 0.22 (tm)    My = 3.87 (tm)  
Xt= 37.5 cm    Yx=0.901    Yt= 52.5 cm    Yy=0.901  
Vd = 58.60/ 58.60 (t)    Vdq =3.9 (t) zemin  
Vp = Y · fctd · Up · d > Vd,    Vd = Vdc - Vdq  
Vxd=58.6 < Vp= 156.52 (t) ZİMBALAMA YETERLİ.  
Vyd=58.6 < Vp= 156.52 (t) ZİMBALAMA YETERLİ.



## S106

d= 35 cm     $A_c = 0.770\text{m}^2$      $\Phi_x=0, \Phi_y=0$   
Ex =-32.4 cm    Ey =-34.9 cm  
Ix = 0.031077 m<sup>4</sup>    Iy = 0.148455 m<sup>4</sup>  
Up = 220.00 cm    fctd=137.94 t/m<sup>2</sup>  
Mx = 4.30 (tm)    My = 1.42 (tm)  
Xt= 15.02 cm    Yx=0.84    Yt= 52.5 cm    Yy=0.84  
Vd = 54.91/ 54.91 (t)    Vdq =3.0 (t) zemin  
Vp = Y · fctd · Up · d > Vd,    Vd = Vdc - Vdq  
Vxd=54.91 < Vp= 89.19 (t) ZİMBALAMA YETERLİ.  
Vyd=54.91 < Vp= 89.19 (t) ZİMBALAMA YETERLİ.

