

JEO TAŞIMA KARŞILAŞTIRMALI DOĞRULAMALAR

ANİ OTURMA ÇÖZÜMLÜ KARŞILAŞTIRMA ÖRNEĞİ

| Açıklama | Değer | Birim |
|---|-------|----------------------|
| Temel genişliği (B) | 6 | [m] |
| Temel uzunluğu (L) | 6 | [m] |
| Temel gömülme derinliği (Df) | 0.5 | [m] |
| Oturma analizi yapılan tabaka kalınlığı | 6 | [m] |
| Temel taban basıncı (qo) | 200 | [kN/m ²] |
| Zeminin Elastisite modülü | 10000 | [kN/m ²] |
| Poisson oranı | 0.3 | [-] |
| Zeminin birim hacim ağırlığı | 18 | [kN/m ³] |

Temelin **orta noktasındaki** konsolidasyon oturması

- Temelin altındaki zeminin tabaka kalınlığı
 $H=6-0.5=5.5$
- Tabaka kalınlığının ortası
 $z=5.5/2=2.75$ m
- Zemin gerilme hesabı (qnet)
 $qnet=qo-Gama \cdot Df = 200-18 \cdot 0,5= 191$
- Etki faktörünün bulunması için m ve n katsayılarının hesabı
 $m=B/z/2 = 6/5.5/2=1.09$
 $n=L/z/2= 6/5.5/2=1.09$

- $m \approx 1.1$ ve $n \approx 1.1$ için *Newmark etki tablosu** ndan enterpolasyon yapılarak ----->
 $I_n = (0.175 + 0.1958)/2 = 0,1854$
- Oturma
 $s = B \cdot (1 - \nu^2) \cdot G_z / E$
 $s = 6 \cdot (1 - 0.3^2) \cdot (191 \cdot 0.1854 \cdot 4) / 10000 = 0.07734$

Jeo Taşıma Rapor Sonucu

Elastisite Yöntemi ile Oturma Analizi

| Açıklama | Yöntem | Formül-Değer |
|------------------------------|-----------------------|---|
| Ani oturma | Timoshenko ve Goodier | $\rho = \frac{qB(1 - \nu^2)I_p}{E}$ |
| Ani oturma için etki faktörü | Boussineq | $I = \frac{1}{4\pi} \left[\frac{2mn\sqrt{m^2 + n^2 + 1}}{m^2 + n^2 + m^2n^2 + 1} \left(\frac{m^2 + n^2 + 2}{m^2 + n^2 + 1} \right) + \tan^{-1} \left(\frac{2mn\sqrt{m^2 + n^2 + 1}}{m^2 + n^2 - m^2n^2 + 1} \right) \right]$ |
| Oturmanın hesaplandığı konum | - | Temel ortası |

1.4 G + 1.6 Q Yüklemesi için Oturma Analizi

| No | Tabaka | d | Kümülatif derinlik | E | v | m | n | I_n | Elastik Oturma [m] |
|----|----------|-----|--------------------|-------|-----|---------|---------|---------|--------------------|
| 1 | Tabaka 1 | 5.5 | 2.75 | 10000 | 0.3 | 1.09091 | 1.09091 | 0.18551 | 0.07738 |

Toplam Elastik oturma : 0.07738 [m]

Sonuç Karşılaştırması

Toplam Oturma

| Nokta | Elle çözüm | Jeo Taşıma sonuç | Karşılaştırma sonucu |
|--------------|------------|------------------|----------------------|
| Temel ortası | 0.07734 | 0.07738 | %99.9 |

* Üniorm yüklü dikdörtgen alanlar için K etki faktörleri

| m | n | | | | | | | | | |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| 0.1 | 0.0047 | 0.0092 | 0.0132 | 0.0168 | 0.0198 | 0.0222 | 0.0242 | 0.0258 | 0.0270 | 0.0279 |
| 0.2 | 0.0092 | 0.0179 | 0.0259 | 0.0328 | 0.0387 | 0.0435 | 0.0474 | 0.0504 | 0.0528 | 0.0547 |
| 0.3 | 0.0132 | 0.0259 | 0.0374 | 0.0474 | 0.0559 | 0.0629 | 0.0686 | 0.0731 | 0.0766 | 0.0794 |
| 0.4 | 0.0168 | 0.0328 | 0.0474 | 0.0602 | 0.0711 | 0.0801 | 0.0873 | 0.0931 | 0.0977 | 0.1013 |
| 0.5 | 0.0198 | 0.0387 | 0.0559 | 0.0711 | 0.0840 | 0.0947 | 0.1034 | 0.1104 | 0.1158 | 0.1202 |
| 0.6 | 0.0222 | 0.0435 | 0.0629 | 0.0801 | 0.0947 | 0.1069 | 0.1168 | 0.1247 | 0.1311 | 0.1361 |
| 0.7 | 0.0242 | 0.0474 | 0.0686 | 0.0873 | 0.1034 | 0.1168 | 0.1277 | 0.1365 | 0.1436 | 0.1491 |
| 0.8 | 0.0258 | 0.0504 | 0.0731 | 0.0931 | 0.1104 | 0.1247 | 0.1365 | 0.1461 | 0.1537 | 0.1598 |
| 0.9 | 0.0270 | 0.0528 | 0.0766 | 0.0977 | 0.1158 | 0.1311 | 0.1436 | 0.1537 | 0.1619 | 0.1684 |
| 1.0 | 0.0279 | 0.0547 | 0.0794 | 0.1013 | 0.1202 | 0.1361 | 0.1491 | 0.1598 | 0.1684 | 0.1752 |
| 1.2 | 0.0293 | 0.0573 | 0.0832 | 0.1063 | 0.1263 | 0.1431 | 0.1570 | 0.1684 | 0.1777 | 0.1851 |
| 1.4 | 0.0301 | 0.0589 | 0.0856 | 0.1094 | 0.1300 | 0.1475 | 0.1620 | 0.1739 | 0.1836 | 0.1914 |
| 1.6 | 0.0306 | 0.0599 | 0.0871 | 0.1114 | 0.1324 | 0.1503 | 0.1652 | 0.1774 | 0.1874 | 0.1955 |
| 1.8 | 0.0309 | 0.0606 | 0.0880 | 0.1126 | 0.1340 | 0.1521 | 0.1672 | 0.1797 | 0.1899 | 0.1981 |
| 2.0 | 0.0311 | 0.0610 | 0.0887 | 0.1134 | 0.1350 | 0.1533 | 0.1686 | 0.1812 | 0.1915 | 0.1999 |
| 2.5 | 0.0314 | 0.0616 | 0.0895 | 0.1145 | 0.1363 | 0.1548 | 0.1704 | 0.1832 | 0.1938 | 0.2024 |
| 3.0 | 0.0315 | 0.0618 | 0.0898 | 0.1150 | 0.1368 | 0.1555 | 0.1711 | 0.1841 | 0.1947 | 0.2034 |
| 5.0 | 0.0316 | 0.0620 | 0.0901 | 0.1154 | 0.1374 | 0.1561 | 0.1719 | 0.1849 | 0.1956 | 0.2044 |
| 10.0 | 0.0316 | 0.0620 | 0.0902 | 0.1154 | 0.1375 | 0.1562 | 0.1720 | 0.1850 | 0.1958 | 0.2046 |
| ∞ | 0.0316 | 0.0620 | 0.0902 | 0.1154 | 0.1375 | 0.1562 | 0.1720 | 0.1850 | 0.1958 | 0.2046 |

| m | n | | | | | | | | | |
|-----|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.5 | 3.0 | 5.0 | 10.0 | ∞ |
| 0.1 | 0.0293 | 0.0301 | 0.0306 | 0.0309 | 0.0311 | 0.0314 | 0.0315 | 0.0316 | 0.0316 | 0.0316 |
| 0.2 | 0.0573 | 0.0589 | 0.0599 | 0.0606 | 0.0610 | 0.0616 | 0.0618 | 0.0620 | 0.0620 | 0.0620 |
| 0.3 | 0.0832 | 0.0856 | 0.0871 | 0.0880 | 0.0887 | 0.0895 | 0.0898 | 0.0901 | 0.0902 | 0.0902 |
| 0.4 | 0.1063 | 0.1094 | 0.1114 | 0.1126 | 0.1134 | 0.1145 | 0.1150 | 0.1154 | 0.1154 | 0.1154 |
| 0.5 | 0.1263 | 0.1300 | 0.1324 | 0.1340 | 0.1350 | 0.1363 | 0.1368 | 0.1374 | 0.1375 | 0.1375 |
| 0.6 | 0.1431 | 0.1475 | 0.1503 | 0.1521 | 0.1533 | 0.1548 | 0.1555 | 0.1561 | 0.1562 | 0.1562 |
| 0.7 | 0.1570 | 0.1620 | 0.1652 | 0.1672 | 0.1686 | 0.1704 | 0.1711 | 0.1719 | 0.1720 | 0.1720 |
| 0.8 | 0.1684 | 0.1739 | 0.1774 | 0.1797 | 0.1812 | 0.1832 | 0.1841 | 0.1849 | 0.1850 | 0.1850 |
| 0.9 | 0.1777 | 0.1836 | 0.1874 | 0.1898 | 0.1915 | 0.1930 | 0.1947 | 0.1956 | 0.1958 | 0.1958 |
| 1.0 | 0.1851 | 0.1914 | 0.1955 | 0.1981 | 0.1999 | 0.2024 | 0.2034 | 0.2044 | 0.2046 | 0.2046 |
| 1.2 | 0.1958 | 0.2028 | 0.2073 | 0.2103 | 0.2124 | 0.2151 | 0.2163 | 0.2175 | 0.2177 | 0.2177 |
| 1.4 | 0.2028 | 0.2102 | 0.2151 | 0.2184 | 0.2206 | 0.2236 | 0.2250 | 0.2263 | 0.2265 | 0.2266 |