

Properties of foundation soil

| | |
|--|-----------|
| Ultimate limit states: | |
| Angle of internal friction | 26 deg. |
| Unit weight | 1.83 t/m3 |
| Unit cohesion | 0 t/m2 |
| Serviceability limit states: | |
| Angle of internal friction | 23 deg. |
| Unit weight | 1.72 t/m3 |
| Unit cohesion | 0 t/m2 |
| Partial safety factor of soil (SNIP 2.02.01-83): | |
| Main combination (sect.2.58) | 1 |
| Earthquake combination (sect.10.3) | 1 |
| Limitation to design strength of soil | 0.8 t/m2 |

Properties of backfill soil

| | |
|------------------------------|-----------|
| Ultimate limit states: | |
| Angle of internal friction | 29 deg. |
| Unit weight | 1.73 t/m3 |
| Unit cohesion | 0 t/m2 |
| Serviceability limit states: | |
| Angle of internal friction | 26 deg. |
| Unit weight | 1.63 t/m3 |
| Unit cohesion | 0 t/m2 |
| Load factor | 1.15 |

Data on retaining wall structure

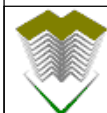
| | |
|--|----------|
| Design model of wall stem - Cantilever | |
| Relative levels of : | |
| top of retaining wall | 2.2 m |
| wall base | -1.1 m |
| soil at back face | 2 m |
| soil at front face | 0 m |
| hinge support | 0 m |
| Backfill slope angle | 0 deg. |
| Wall base slope angle | 0 deg. |
| Safety factor (Appendix 7 SNIP 2.01.07-85) | 1.0 |
| $Yc1*Yc2/k$ (SNIP 2.02.01-83) sect.2.41 | 1.3 |
| Product A*K1 for seismic region (Manual) | 0.0 |
| Earthquake repetition (SNIP II-7-81) | 0.0 |
| Crack resistance category | 3 |
| Width of crack propagation (short-term) | 0.0004 m |
| Width of crack propagation (long-term) | 0.0003 m |
| Safety factor (SNIP 2.02.01-83) | 1.2 |
| Load factor | 1.1 |

Loads on backfill soil

| | |
|-------------------------------------|---------|
| Load : across area | |
| Value of normative distributed load | 1.4t/m2 |
| Bandwidth | ----- |
| Distance from load to wall stem | ----- |

Concrete and reinforcement

| | |
|---|---------|
| Class of concrete | B30 |
| Class of reinforcement | AIII |
| Maximum percentage of reinforcement: | |
| wall stem | 1 |
| wall base | 1 |
| Distance from section side to g.c. of longitudinal reinforcement: | |
| wall stem | 0.035 m |
| wall base | 0.035 m |



Geometry of retaining wall

| | |
|-------------------------------------|--------|
| Mode - check | |
| length of toe | 0.4 m |
| width of base | 2.1 m |
| Height of retaining wall | 3.3 m |
| Thickness of section: | |
| top of wall stem | 0.16 m |
| stem where connected with wall base | 0.26 m |
| end of heel | 0.2 m |
| heel where connected with stem | 0.3 m |
| end of toe | 0.2 m |
| toe where connected with stem | 0.3 m |

Analysis results of soil

| Serviceability limit states | | | | Ultimate limit states | | | stability of foundation soil $Y_c \cdot F_{restr.} / F_{shear} / Y_n$ | |
|---------------------------------|----------------|------|-----------------|--|-----------------------------|-------|--|------|
| Stress under wall base, t/m^2 | | | | $Y_c \cdot F_{restr.} / F_{shear} / Y_n$ | | | | |
| R | Toe cantilever | Mean | Heel cantilever | by wall base | Slope angle of slip surface | | | |
| | | | | | 0 | $j/2$ | j | |
| 11.6 | 11.2 | 5.76 | 0.33 | 1.3 | 1.3 | 1.47 | 1.61 | 1.07 |

Combinations of design forces and reinforcement

| Section No. | Design forces (t, t^*m) | | | | | | Section thickness (m) | Reinforcement, cm^2 | | | | Crack (mm) |
|-------------|-----------------------------|--------|--------|-----------------------------|--------|--------|-----------------------|-----------------------|--------|----------|--------|------------|
| | Ultimate limit states | | | Serviceability limit states | | | | Area FA | | Area FA1 | | |
| | M | N | Q | M | N | Q | | by ULS | by SLS | by ULS | by SLS | |
| 1 | 0 | 0 | -0.001 | 0 | 0 | -0.001 | 0.16 | 0.625 | 0.625 | 0.625 | 0.625 | 0.0 |
| 2 | 0 | 0 | -0.001 | 0 | 0 | -0.001 | 0.16 | 0.625 | 0.625 | 0.625 | 0.625 | 0.0 |
| 3 | 0.027 | -0.231 | 0.188 | 0.027 | -0.21 | 0.189 | 0.177 | 0.708 | 0.708 | 0.708 | 0.708 | 0.0 |
| 4 | 0.227 | -0.486 | 0.64 | 0.226 | -0.442 | 0.631 | 0.193 | 0.792 | 0.792 | 0.792 | 0.792 | 0.0 |
| 5 | 0.697 | -0.763 | 1.26 | 0.685 | -0.694 | 1.23 | 0.21 | 0.875 | 0.875 | 0.875 | 0.875 | 0.0 |
| 6 | 1.52 | -1.06 | 2.06 | 1.48 | -0.967 | 1.99 | 0.227 | 1.848 | 1.848 | 0.958 | 0.958 | 0.0 |
| 7 | 2.78 | -1.39 | 3.02 | 2.7 | -1.26 | 2.9 | 0.243 | 3.337 | 3.337 | 1.042 | 1.042 | 0.0 |
| 8 | 4.57 | -1.73 | 4.16 | 4.41 | -1.58 | 3.97 | 0.26 | 5.26 | 7.865 | 1.125 | 1.125 | 0.299 |
| 9 | 1.35 | 0 | 3.33 | 1.34 | 0 | 3.29 | 0.25 | 1.539 | 1.539 | 1.075 | 1.075 | 0.0 |
| 10 | 4.2 | 0 | 4.16 | 4.09 | 0 | 3.88 | 0.3 | 4.188 | 4.188 | 1.325 | 1.325 | 0.0 |
| 11 | 0.728 | 0 | 3.51 | 0.681 | 0 | 3.26 | 0.3 | 1.325 | 1.325 | 1.325 | 1.325 | 0.0 |

