

Cantilevered Retaining Wall

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ENERCALC, INC. 1983-2015, Build:6.15.10.6, Ver:6.15.10.6

Lic. #: KW-06010584

Licensee: Aedifica Case Engineering

Description: Retaining Wall - 5'-8" Tall

Calculations per ACI 318-08, ACI 530-08, IBC 2009, CBC 2010, ASCE 7-05

Criteria

| | | |
|---|---|----------|
| Retained Height | = | 5.67 ft |
| Wall height above soil | = | 4.00 ft |
| Slope Behind Wall | = | 0.00 : 1 |
| Height of Soil over Toe | = | 20.00 in |
| Water height over heel | = | 0.0 ft |
| Vertical component of active Lateral soil pressure options: | | |
| NOT USED for Soil Pressure. | | |
| NOT USED for Sliding Resistance. | | |
| NOT USED for Overturning Resistance. | | |

Soil Data

| | | |
|--|---|--------------|
| Allow Soil Bearing | = | 2,000.0 psf |
| Equivalent Fluid Pressure Method | | |
| Heel Active Pressure | = | 35.0 psf/ft |
| Toe Active Pressure | = | 30.0 psf/ft |
| Passive Pressure | = | 250.0 psf/ft |
| Soil Density, Heel | = | 110.00 pcf |
| Soil Density, Toe | = | 110.00 pcf |
| Friction Coeff btwn Ftg & Soil | = | 0.400 |
| Soil height to ignore for passive pressure | = | 12.00 in |

Surcharge Loads

| | | |
|--------------------------------------|---|-----------|
| Surcharge Over Heel | = | 100.0 psf |
| Used To Resist Sliding & Overturning | | |
| Surcharge Over Toe | = | 0.0 psf |
| Used for Sliding & Overturning | | |

Axial Load Applied to Stem

| | | |
|-------------------------|---|---------|
| Axial Dead Load | = | 0.0 lbs |
| Axial Live Load | = | 0.0 lbs |
| Axial Load Eccentricity | = | 0.0 in |

Design Summary

| | | |
|--|-----------------------------------|--------------|
| Wall Stability Ratios | | |
| Overturning | = | 2.63 OK |
| Sliding | = | 2.12 OK |
| <i>Slab Resists All Sliding !</i> | | |
| Total Bearing Load | = | 2,981 lbs |
| ...resultant ecc. | = | 7.54 in |
| Soil Pressure @ Toe | = | 1,538 psf OK |
| Soil Pressure @ Heel | = | 15 psf OK |
| Allowable | = | 2,000 psf |
| <i>Soil Pressure Less Than Allowable</i> | | |
| ACI Factored @ Toe | = | 1,846 psf |
| ACI Factored @ Heel | = | 18 psf |
| Footing Shear @ Toe | = | 2.3 psi OK |
| Footing Shear @ Heel | = | 29.4 psi OK |
| Allowable | = | 94.9 psi |
| Sliding Calcs | <i>Slab Resists All Sliding !</i> | |
| Lateral Sliding Force | = | 873.0 lbs |
| less 100% Passive Force | = - | 656.3 lbs |
| less 100% Friction Force | = - | 1,190.0 lbs |
| Added Force Req'd | = | 0.0 lbs OK |
| ...for 1.5 : 1 Stability | = | 0.0 lbs OK |

Lateral Load Applied to Stem

| | | |
|---------------------|---|---------|
| Lateral Load | = | 0.0 plf |
| ...Height to Top | = | 0.00 ft |
| ...Height to Bottom | = | 0.00 ft |

Wind on Exposed Stem = 5.0 psf

Adjacent Footing Load

| | | |
|---------------------------------------|---|-----------|
| Adjacent Footing Load | = | 0.0 lbs |
| Footing Width | = | 0.00 ft |
| Eccentricity | = | 0.00 in |
| Wall to Ftg CL Dist | = | 0.00 ft |
| Footing Type | | Line Load |
| Base Above/Below Soil at Back of Wall | = | 0.0 ft |
| Poisson's Ratio | = | 0.300 |

Stem Construction

| | Top Stem | 2nd |
|-------------------------|----------------|----------|
| Design Height Above Ftg | ft = 5.67 | Stem OK |
| Wall Material Above "H" | = Fence | Concrete |
| Thickness | in = 0.00 | 8.00 |
| Rebar Size | = # 5 | # 5 |
| Rebar Spacing | in = 12.00 | 12.00 |
| Rebar Placed at | = Edge | Edge |
| Design Data | | |
| fb/FB + fa/Fa | = | 0.328 |
| Total Force @ Section | lbs = 20.0 | 1,153.8 |
| Moment....Actual | ft-l = 40.0 | 2,726.8 |
| Moment.....Allowable | ft-l = 0.0 | 8,312.6 |
| Shear.....Actual | psi = 0.0 | 15.5 |
| Shear.....Allowable | psi = 0.0 | 94.9 |
| Wall Weight | psf = 0.0 | 100.0 |
| Rebar Depth 'd' | in = 0.00 | 6.19 |
| Lap splice if above | in = 0.00 | 18.50 |
| Lap splice if below | in = 0.00 | 3.60 |
| Hook embed into footing | in = 0.00 | 3.60 |
| Concrete Data | | |
| f'c | psi = 4,000.0 | 4,000.0 |
| Fy | psi = 20,000.0 | 20,000.0 |

Load Factors

| | |
|------------|-------|
| Dead Load | 1.200 |
| Live Load | 1.600 |
| Earth, H | 1.600 |
| Wind, W | 1.600 |
| Seismic, E | 1.000 |