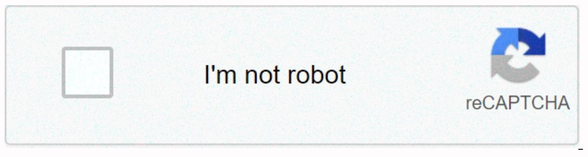

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The song that never ends chords

Follow our official Facebook page (@civilengineeringbible) and Twitter page (@CivilEngBible) and don't miss out on the best civil engineering tools and articles! The CivilWeb Soil Bearing Capacity Calculation Excel Suite contains all the tools required to perform a detailed load capacity analysis of each soil. The CivilWeb Soil Bearing Capacity Calculation Excel Suite includes 9 different methods for calculating load capacity from soil property data or location survey results. The spreadsheet contains unique analysis tools that allow the designer to perform a detailed load-bearing capacity analysis of each soil in minutes. The CivilWeb Soil Bearing Capacity Calculation Excel Suite can be purchased at the end of this page for only 20 dollars. Alternatively, the Soil Bearing Capacity Suite is included in the full Foundation Design Spreadsheet Suite, which includes all 12 Design Table Suites for just 50 dollars. Soil load-bearing capacity is very often used in foundation design to facilitate the reaction of the soils to the foundation. The calculation of soil load capacity is very conservative, so that the designer can be sure that if the soil load capacity is not exceeded, the foundation is stable and does not settle excessively. It should be noted that due to consolidation, some soils can continue to settle for many years after the foundation is built. In such cases, a separate settlement analysis should be carried out together with the calculation of the load-bearing capacity. A simple design table such as the CivilWeb Settlement Analysis Suite can be used. Note that a special package of CivilWeb Floor Storage Capacity Calculation and Settlement Analysis Suite, worth a combined value of 40 dollars, can be purchased for only 25 dollars at the end of this page. There are many different methods to perform the calculation of soil load-bearing capacity. The first popular method for calculating soil load-bearing capacity was derived from Terzaghi. This method assumes a shear error level and then calculates the pressure required to create that error level using ground thickness parameters. The Terzaghi method has subsequently been revised several times, but is still used occasionally today. This method of shear fault level analysis remains the basis of modern methods for calculating soil load-bearing capacity. Several changes to the Terzaghi method have been proposed, either to improve accuracy or to extend the method to other design conditions such as foundations on slopes. The methods most commonly used today are based on the Meyerhof method in the USA or the Hansen or Vesic methods in Europe. Several national and Design standards have also proposed changes in the calculation of soil load-bearing capacity. The CivilWeb Soil Bearing Capacity Calculation Excel Suite contains the Eurocode 7 method and the BS 8004 method, the variants of the Hansen Hansen There are also methods for calculating soil load capacity from site investigation information. This is particularly useful for the preliminary draft, where only general results of the site study are known. The CivilWeb Soil Bearing Capacity Calculation Excel Suite includes methods for calculating soil load capacity from three different site survey results, SPT data, CPT data, and disk bearing test results. For the preliminary basic construction, it is common for the designer to choose a typical soil load capacity that is simply based on the soil type. For more information, see our articles on rock load capacity, typical soil storage capacity and safe soil load capacity. CivilWeb Floor Storage Capacity Calculation Excel Suite - Inputs The simplest analysis method developed by Terzaghi requires the designer to enter the length, width and depth of the foundation, and the density and shear strength parameters for the floor. The soil strength parameters can be taken from the soil test. The designer should enter a test size for the foundation, which can then be iteratively adjusted to optimize the foundation design. The geometric foundation size parameters influence the load-bearing capacity of the floor and also affect the bearing pressure under the foundation. A larger foundation both increases soil load capacity and reduces bearing pressure. This effect is often neglected in the foundation design, but can have a significant influence on the required size of the foundation. The unique analysis tools of the CivilWeb Soil Bearing Capacity Calculation Excel Suite show the designer at a glance exactly how the soil load capacity is changed by changing the size or depth of the foundation. This makes optimizing the design easy. Other methods have been developed to take into account broader site conditions and therefore require a few more input. These include the eccentricity of the load, the inclination of the load, the inclination of the nearby slopes and the inclination of the base of the foundation. All these factors affect the calculation of soil load capacity and different methods are suitable for different site conditions. Of course, the job capability tables, which are based on the results of the site study, require the designer to enter these results. The results may come from an SPT, CPT or plate bearing test performed on the proposed foundation. Ideally, this test should be right at the point for the foundation. CivilWeb Floor Storage Capacity Calculation Excel Suite The CivilWeb Floor Storage Capacity Calculation Excel Suite contains the following spreadsheets; The Soil Bearing Capacity Calculation Excel Suite contains all the tools required to perform a detailed analytical calculation of soil load capacity. The table contains unique tools that help the designer to reduce the impact of foundations on load-bearing capacity. Using it with a foundation design table such as our Pad Footing Design Spreadsheet allows the designer to complete a fully optimized foundation design in minutes. This saves the designer from performing several time-consuming soil load-bearing capacity calculations by hand. Buy the CivilWeb Soil Bearing Capacity Calculation Excel Suite now for just 20 dollars. To try out a fully functional free trail version of this software, please enter your email address below to sign up for our newsletter. Our full Foundation Design Suite includes all 12 of our Foundation Design tables for only 50 dollars (80% off). The CivilWeb Soil Bearing Capacity Calculation Excel Suite contains the Terzaghi load-bearing scale along with 5 other analysis methods and 3 methods based on site investigation information. The Terzaghi load-bearing method was the first method of analysis to be developed, and although it has been extended several times, the Terzaghi method is still widely used today. The CivilWeb Soil Bearing Capacity Calculation Excel Suite can be purchased at the end of this page for only 20 dollars. Alternatively, the Bearing Capacity Suite is also included in the full Foundation Design Suite, which includes all 12 of our Foundation Design tables for as little as USD 50. This can also be purchased at the end of this page. The earliest method for the analysis of load-bearing capacity was developed by Terzaghi. This is based on Prandtl's work in the 1920s, which was derived from the punch resistance of metals. Terzaghi adapted this work in the 1940s to apply the principles to the problem of the flat foundations to be worn on floors. He used this plasticity theory and an assumed shear failure surface to calculate the pressure required to achieve a shear error in the ground. For his plastic analysis, Terzaghi assumed that the ground's failure surface would take the form shown in the following diagram. Below the foundation, a wedge of the ground remains intact and is pushed down by the loads acting on the foundation. This wedge of moving ground creates a radial shear zone that extends from each edge of the wedge. Terzaghi takes the form of these radial shears as a series of logarithmic spirals. The third shear zone is formed as a linear shear zone in which the soils can shear along planar surfaces. Terzaghi Bearing Capacity Equations Terzaghi first analysis of infinite band foundations was later adapted to three equations that estimate the load-bearing capacity of the soil for square, circular or stripe foundations. These equations take the Load capacity analysis form of three parts that take into account the effects of soil cohesion, impact, and the weight of the soil. The Terzaghi storage capacity equations are shown below, where the finite load-bearing capacity of the soil (qult) of the effective effective of the ground (c'), the effective friction angle of the floor, the vertical effective tension in depth D (ZD), the effective unit weight of the floor (y'), the depth of the foundation base (D) and the foundation width (B). These include the Terazghi load-bearing factors Nc, Nq and N. Terzaghi defined these load-bearing factors on the basis of the following equations; The Terzaghi load-bearing factors have often been presented in tabular or graphical form in the past to simplify calculations in front of computers. These tables and graphs are shown below. Terzaghi calculated the value for Kp using graphical methods on the assumption that in practice his tabular values would be used for the Terzaghi load-bearing factors. The CivilWeb Soil Bearing Capacity Calculation Excel Suite uses a slightly simplified equation to calculate N, as shown below. Terzaghi adopted the following parameters to model the shear failure of the soils under the foundation; The foundation is flat, i.e. the depth is not greater than the width. The foundation is infinitely long. This allows Terzaghi to treat the foundation as a two-dimensional problem that simplifies analysis. Terzaghi later added shape coefficients to convert the results into finite square, circular, or stripe foundations. The base of the foundation is rough enough to prevent a sliding between the foundation and the supporting floors. This is generally acceptable for most concrete foundations that are poured into situ. The supporting floors are modelled as a homogeneous semi-infinity mass. This is, of course, often not appropriate, especially in soils with different layers. The shape of the failure surface means that only the soils between depth D and D + B must be taken into account. The underlying soils are not taken into account, nor are the soils above the base of the foundation. It is assumed that the presence of groundwater is taken into account in the parameter for the effective weight of the unit. The shear strength of the soil is determined by the following equation; No solidification of the soil takes place, the settlement is only due to scissors and movement of the soil under the applied load. Terzaghi failed to include the shear strength of the soils above the base of the foundation and simply treated them as impact pressure from the self-weight of the soils. This assumption is conservative and causes the Terzaghi analysis method for deep foundations to disintegrate. This also means that the strength or cohesion of these soils does not have to be taken into account in the analysis. It is assumed that the foundation is much stiffer than the ground. This, too, is often appropriate, especially for isolated Long strip foundations or large rafts can sometimes be modeled as flexible structures with the beam on an elastic foundation modeling methods. The applied loads are axial and have an effect through Centrifuges of foundations, and the ground is not inclined or close to any slopes. This, too, is often appropriate, although not always. Terzaghi modeled only the general shear error mode, not local or punching shear errors. This is usually sufficient as long as an appropriate billing analysis is also carried out. The above equations are represented in the form of effective stresses. It is possible to convert this into an overall stress analysis when the soil conditions are saturated and unbridled. This can be done by replacing the values for c', '' and 'D' for cT, 'T' and 'D'. Terzaghi also created modified equations to calculate the load-bearing capacity of soils exposed to local shear failure. To do this, the cohesion and angle of internal friction must be reduced with the following equations. These modified values are then used to calculate the Terzaghi load-bearing factor in the same way as for the general shear error conditions explained above. Many charts and tables have also been created to illustrate the load-bearing factor values for local errors in the same way as the values for common shear errors. Examples of these tables and graphs are shown below. The Terzaghi load-bearing capacity analysis is still in use today, especially for preliminary analysis. This is because the analysis is known and relatively simple. However, it does not take into account a number of common problems, such as eccentric or inclined stress, and has been improved several times in the following decades to increase accuracy and increase the range of conditions that can be taken into account. In general, the Terzaghi load-bearing theory has been replaced by subsequent methods, although the Terzaghi load-bearing capacity equation could still be used in simple cases where the design conditions are appropriate. CivilWeb Floor Storage Capacity Calculation Excel Suite The CivilWeb Floor Storage Capacity Calculation Excel Suite contains a Terzaghi load capacity table. This spreadsheet suite includes 9 different methods for calculating load-bearing capacity, including analysis-analytical methods and methods based on site investigation information. The spreadsheet suite also includes unique comparison tools that complete the inventory capacity calculations for all 6 analysis methods. This allows the designer to compare results and select the most appropriate load-bearing value or even an average of all 6 methods. Buy the CivilWeb Soil Bearing Capacity Calculation Excel Suite now for just 20 dollars. To get a fully functional free trail version of this software please enter your e-mail address below to subscribe to our newsletter. Our full Foundation Design Suite includes all 12 of our Foundation Design tables for only 50 dollars (80% off). discount). discount).