Anchor bolts design examples

The purpose of anchor bolts is to transfer loads to the wall from attachments such as books, window sills, and bearing points. These anchor bolts are traditionally made of threaded steel and have a threaded shank or a spigot that extends through the wall. The threads allow them to be screwed into the masonry, which provides the transfer of loads. Anchor bolts are used to transfer loads to the wall in various applications such as masonry structures, concrete masonry structures, and masonry buildings. They are commonly used in building construction to transfer loads from masonry to concrete or other structural elements.

In the case of anchor bolts, the depth from the midline of the anchor to the edge of the wall, $d$, is measured in millimeters (mm) or inches (in). The strength reduction factor, $\Phi$, is a factor that represents the normalized strength of the anchor. The standard for masonry structures, TMS 605-13/ACI 530.1-13/ASCE 5-14, specifies that $\Phi$ is equal to 0.5 when the nominal anchor is controlled by bearing (Equation 7), and $\Phi$ is equal to 0.75 when the nominal anchor is controlled by anchoring (Equation 8). The relationship between the ductile strength and the permissible shear loads and the permissible incision loads and shear is provided in the standard.

In this particular example, given the shear loading direction and the long edge of the anchor is calculated. In this case, the shear bolt becomes: Using the equation above, the modified Apt is 90.99 in² (578.03 cm²). Axial tensile strength, on the other hand, is calculated using the following equation: The relationship between the ductile strength and the permissible shear loads and the permissible incision loads and shear is provided in the standard.

The total shear force of the joint is 7.12 kN (1600 lbs), with each anchor screw resistant to half the total load. As is typical, the shear strength of anchors is at least equal to the diameter of the anchor, but less than 25.4 mm (1 inch) to ensure adequate anchor embedment in the mortar. The design tolerances for anchor placement vary depending on the application. In the absence of such criteria, the design tolerances used to place the structural elements are determined by the manufacturer or code requirements.

In the case of masonry structures, the requirements for masonry anchors are specified in TMS 605-13/ACI 530.1-13/ASCE 5-14. The standard for masonry structures, TMS 605-13/ACI 530.1-13/ASCE 5-14, specifies that $\Phi$ is equal to 0.5 when the nominal anchor is controlled by bearing (Equation 7), and $\Phi$ is equal to 0.75 when the nominal anchor is controlled by anchoring (Equation 8). The relationship between the ductile strength and the permissible shear loads and the permissible incision loads and shear is provided in the standard.

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