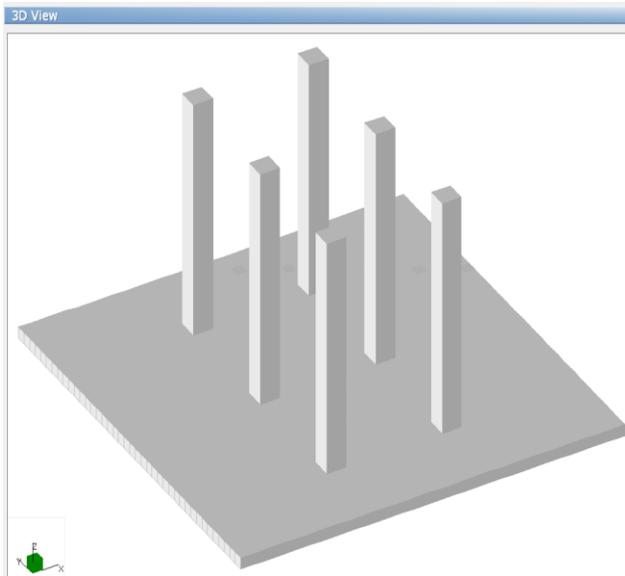


FIBER REINFORCED CONCRETE SLABS ON GRADE

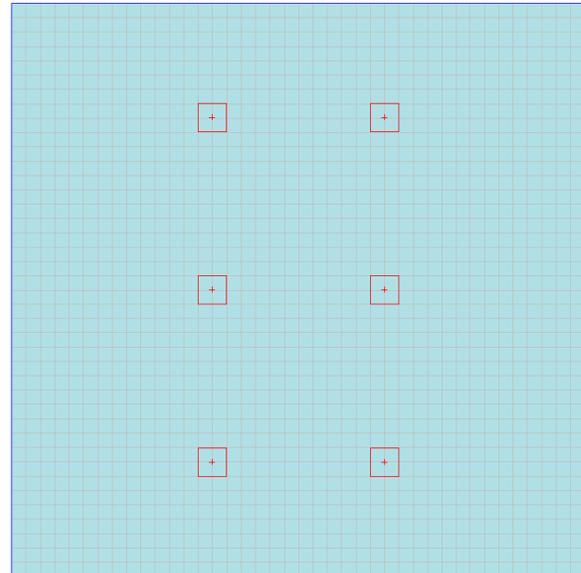
Ground supported slabs may be specified with fiber reinforcement in lieu of a single layer of reinforcing or welded wire fabric. Such slabs are referred to as membrane slabs, floating slabs, or filler slabs and range in thickness from as little as 4” to 8” depending on the supported loads. In warehouses and storage facilities such slabs may be subjected to concentrated point loads from storage rack posts or forklift wheel loads.

Example Model with Sample Input:

In this example, a concrete warehouse floor with joints spacing 20’ o.c. a slab is subject to modular racking posts loads of 3,750 lbs each in a grid of 6’x6’. The 6” slab is supported on soil with a subgrade modulus of 100 kcf.



3D View



Plan View

The existing design called for a macro fiber dosage for TUF-STRAND SF as 4.9 lbs/yd³ per the table below (Courtesy of Euclid Chemical). Concrete strength is 4 ksi. In order to use the table, the reinforcement is to be of Grade 60 and placed in the top half of the slabs on grade.

Quick Reference Guide for Slab on Ground Design with TUF-STRAND macro-fibers, lbs/yd³ (kg/m³)

| Slab Thickness | all 6" x 6" (150 x 150 mm) | | | 4" x 4" (100 x 100mm) | | #3 bar (3/8") | | #4 bar (1/2") | |
|----------------|----------------------------|---------------|---------------|-----------------------|---------------|---------------|---------------|---------------|---------------|
| | 10 gage (W1.4) | 6 gage (W2.9) | 4 gage (W4.0) | 6 gage (W2.9) | 4 gage (W4.0) | @16" (406 mm) | @12" (305 mm) | @16" (406 mm) | @12" (305 mm) |
| 4 | 3.0 (1.8) | 3.0 (1.8) | 4.6 (2.7) | 5.1 (3.0) | 7.4 (4.4) | 3.9 (2.3) | 5.6 (3.3) | 7.9 (4.7) | 10.8 (6.4) |
| 6 | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 4.6 (2.7) | 3.0 (1.8) | 3.4 (2.0) | 4.9 (2.9) | 6.9 (4.1) |
| 8 | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 3.2 (1.9) | 3.0 (1.8) | 3.0 (1.8) | 3.4 (2.0) | 4.9 (2.9) |
| 10 | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 3.0 (1.8) | 3.7 (2.2) |

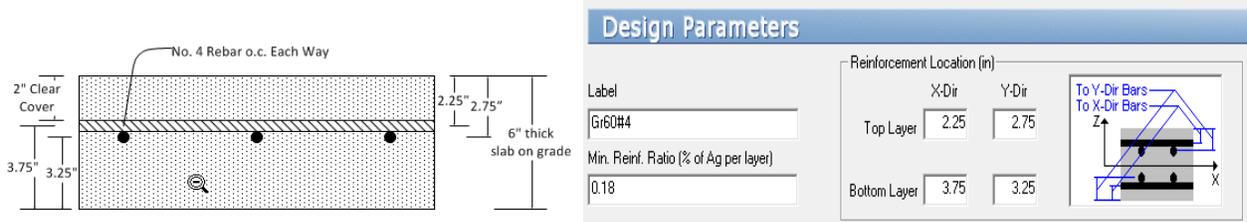
TUF-STRAND
MaxTen™

TUF-STRAND
SF

To investigate or design a slab with fiber-reinforcement, spMats requires design parameters definition to have a single layer of reinforcement input. From the table above, for a 6” slab, an equivalent single layer reinforcement to the specified macro fiber dosage is #4 @ 16 in. which is equal to 0.15 in²/ft.

Design Parameters Input

An equivalent single layer of reinforcing design parameter input is shown below and complies with the requirements to use the table above



Interpretation of Reinforcement Output:

spMats displays the required area of reinforcement as a contour view as well as a text output for each element. The contour views of required reinforcement envelopes in the X-Direction and Y-Direction are shown below. The governing required reinforcement amount is 0.141 in²/ft which is less than 0.15 in²/ft. Therefore, the specified macro fiber dosage for TUF-STRAND SF as 4.9 lbs/yd³ provides the required replacement for this existing slab on grade.

