

Mathcad - [ShearconnectionDESIGN_10SEP01]

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KNOW MATHCAD

Spreadsheet for Design Calculations

DESIGN OF SHEAR CONNECTION

Strength Parameters

Grade of Bolts = 8.8

Input Details data := 1

$i := 0..20$

$\left(\begin{matrix} Input \\ Input2 \end{matrix} \right) =$

Worksheet

$sect_i := Input_{i,0}$

$h_i := Input_{i,1}mm$

$t_i := \max\{Input_{i,2}, Input_{i,3}\}mm$

$\phi_i := Input_{i,6}mm$

$e1_i := Input_{i,8}mm$

$d_{o_i} := \phi_i + 2mm$

$t_{p_i} := Input_{i,11}mm$

$V_{ap_i} := Input2_{i,1}kN$

$A_{g_i} := Input2_{i,3}cm^2$

$t_{w_i} := Input_{i,2}mm$

$cl_i := Input_{i,5}mm$

$n_i := Input_{i,7}$

$p_i := Input_{i,9}mm$

$guage_i := Input_{i,10}mm$

$w_i := Input2_{i,0}mm$

$T_{ap_i} := Input2_{i,2}kN$

$e2_i := e1_i$

$data := data - 1$



Know Mathcad

- ✓ Mathcad combines a powerful computational engine, accessed through conventional math notation, with a full-featured word processor and graphing tools.
- ✓ Standard mathematical notation, text, and graphs –single document.
- ✓ Unit-aware calculations.

$$X = \frac{-b + \sqrt{b^2 - 4 \cdot a \cdot c}}{2 \cdot a}$$



Know Mathcad

✓ Mathcad

$$X = \frac{-b + \sqrt{b^2 - 4 \cdot a \cdot c}}{2 \cdot a}$$

✓ Programming language

$$X = (-B + \text{SQRT}(B**2 - 4 * A * C)) / (2 * A)$$

✓ Spread sheet

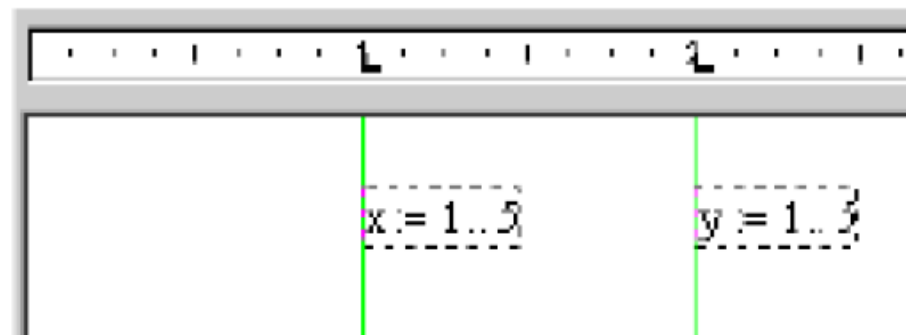
$$+(-B1 + \text{SQRT}(B1 * B1 - 4 * A1 * C1)) / (2 * A1)$$



Mathcad Workspace

- Blank worksheet - can enter text, math equation, graph and images.

Worksheet Ruler



- Guideline – to align regions.



Mathcad Sample

DOC. NO:

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PREPARED BY : RJ

DATE: 6/18/2009

CHECKED BY : JA

RESULT

REVISION :

CALCULATION

Slab design for a span of 3.50m X 3.50m(S2)

Assuming depth of slab as 150mm $D := 150\text{mm}$

Material Properties

$$\gamma_c := 25 \frac{\text{kN}}{\text{m}^3} \quad f_{ck} := 30 \frac{\text{N}}{\text{mm}^2} \quad f_y := 500 \frac{\text{N}}{\text{mm}^2}$$

Providing 8mm dia bars and 30mm cover

$$\text{Dia, } \phi_1 := 8\text{mm} \quad \text{Cover, } C_c := 30\text{mm} \quad \text{Effective depth, } d_{\text{eff}} := D - C_c - \frac{\phi_1}{2} \quad d_{\text{eff}} = 0.12\text{m}$$

$$\text{Span, } l_y := 3.5\text{m} \quad l_x := 3.5\text{m} \quad b := 1\text{m}$$

