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1 SCOPE

The SikaFiber® software is a desktop tool for calculating the dosage of fiber required for a reinforced industrial concrete ground slab ("The Product Proposal"). This manual describes the method of downloading, registering and navigating the SikaFiber® software.

The User has the option of calculating the dosage of fiber follows according to one of two globally recognised guidelines, referred to as ‘Standards’


Reference is also made to ACI 544 4R - Guide to Design with Fiber-Reinforced Concrete.

IT IS STRONGLY RECOMMENDED TO HAVE A COPY OF THE RELEVANT STANDARD FOR USE WITH THE SOFTWARE

2 DEVELOPMENT

The software has been developed by CYPE Ingenieros S:A, a specialist company that develops and distributes technical software for Architecture, Engineering and Construction professionals.

The software is maintained and will be periodically updated.

3 GETTING STARTED

3.1 LANGUAGE AND END-USER LICENSE AGREEMENT

On opening the software, a window will appear with language options and the end-user license agreement.

Language options are displayed at the bottom of the screen. Select from the available options. If your language is not there, and you cannot use what is available, contact your local Sika Technical Department.

The software is licensed and not sold. It is important to read the “end-user licence agreement” carefully and click “accept” to continue. Otherwise, click “cancel” to exit.

3.2 PRIVACY POLICY

Sika provides a Privacy Notice for our business partners (and Clients). This is also regulated by the EU for EEA citizens (regulation EU 2016/679 – GDPR). The Privacy Note and Privacy Email is downloadable from the software. Further information can be found on the Sika website, https://gdpr.sika.com/

3.3 DOWNLOADING THE FILE

The software can be download from the Sika group web site www.sika.com/sikafiber-software or from your local Sika country web site. Install only the file “Install SikaFiber.exe”. You need to have the computer’s administrator rights to install the software. If you do not have administrator rights, contact your IT department for assistance.
3.4 USERS

The software is intended of professionals with expert knowledge in the area of application. The term “User” is used to define the professional in this manual.

3.5 REGISTRATION

The SikaFiber® software is free to use for 15 days. Activate the software by selecting the online activation. This requires an active internet connection. Complete the form which requires some basic information about you your company and contact details. Read the privacy note and “accept” to continue or “cancel” to exit.

Shortly afterwards you will receive a verification email. Follow the instructions and when completed the software will be ready to use by clicking the access button. If you have any difficulties, please contact your local Sika Technical Department.

The registration is restricted to one user and on one device. Should you change your device, you will be asked to register again.

If the software is not registered within 15 days, the User will no longer be able to access the software until the registration process is complete.

3.6 UPDATES

The software may be periodically updated. SikaFiber® Software updates could be due, and limited to:

- As a result of a Windows update or new version
- New language addition
- New SikaFiber® products, updated properties
- Server maintenance
- Improvements

If an update is available, the following message will appear

Click "Yes" to install the update and close the SikaFiber® software. Wait a few minutes, open the software again and the following message should appear.
When the update is installed the following message will appear.

If there is a problem check with your IT department there are update permissions available, or if administration rights are required. If this does not solve the issue contact your local Sika Technical Department.

4 FEATURES

4.1 MAIN INTERFACE

The user interface consists of FIVE main parts

1. Options menu
2. Navigation bar
3. User input
4. Graphic representation
5. Secondary navigation

4.1.1 OPTIONS MENU

The options menu is opened by clicking on the Sika logo in the top left-hand corner, and will display the following options:

- **New**: Create a new project
- **File**: Displays the file manager to see where the projects are listed and saved
- **Save**: Save a project
- **Save As**: Save a project to a folder location
- **Recent files**: Displays recently created files
- **Exit**: Closes the software
4.1.2 NAVIGATION BAR

The navigation bar has five main steps to guide you through the calculation process. When displayed, it is possible to navigate forward or back.

1. Project information (Section 6 of this manual)
2. Loading (Section 7 of this manual)
3. Check and design (Section 8 of this manual)
4. Results (Section 9 of this manual)
5. Printout (Section 10 of this manual)

It is not possible to continue to a next step until the previous step is completed. An error message will be displayed in the bottom left corner of the window to indicate the reason.

→ On starting a calculation, the project information and loadings will be displayed.

→ The check and design and results will only be displayed when loads have been correctly added.

→ The printout will be displayed only when the slab passes the checks.

TR34 navigation bar

ACI 360 navigation bar

4.1.3 USER INPUT

The User is required to add the parameters required for the calculation and is responsible for ensuring the values are correct.

4.1.4 GRAPHIC REPRESENTATIONS

Graphics are an aid to the user input requirements. They are there to illustrate the parameters required for the input.
4.1.5 SECONDARY NAVIGATION
The secondary navigation bar allows the User to move forwards and backwards between the calculation steps.

4.2 ADDITIONAL FEATURES

4.2.1 INFORMATION ICONS
Information symbols open a window to give the User additional guidance about the parameter. They may contain some indicative values or refer to relevant clauses in the Standards.

4.2.2 ERROR MESSAGES
Error messages are displayed in the bottom left corner of the window. For example, if the check and design or the printout step is not displayed the reason will be shown here.

4.2.3 CALCULATION FILES
The calculation files are stored automatically on the User’s hard drive, in ‘my documents’. A file called Sika Fiber is automatically created during the installation process. Calculation files are created in .skf$ and .skfb format.

Should the software be updated after the file is created, the calculation shall continue to contain and use the original parameters at the time of creation.

4.2.4 FORMULAS
Formulas used in the calculations will be displayed in the results section and on the printout. Clicking on the information icon will give some more additional information about the calculation.
5 STARTING A PROJECT

5.1 PROJECT PARAMETERS

The project parameters window is displayed automatically for the first calculation. In subsequent calculations the last project will automatically be displayed.

To open a new project, open the options menu in the top left corner (Sika logo) and select new. You will be prompted to add a file name and define the file location.

There are three options in the project parameters. Once accepted for the calculation it is not possible to change this selection. In this event the User must start a new project.

<table>
<thead>
<tr>
<th>Standard</th>
<th>Country of Project</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select from the TR34 (metric) or ACI 360R-10 (metric or imperial)</td>
<td>It is possible to be a User in country A designing a project in country B. This is relevant to the available local range of SikaFiber® products</td>
<td>Select your preferred units for calculation parameters</td>
</tr>
</tbody>
</table>

6 PROJECT INFORMATION

Project information window
6.1 PROJECT INFORMATION

The User has the option to define information about the project, the location, date of calculation, or can add some additional remarks for future reference. Filling out the project information fields is not compulsory to continue to the next steps.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project reference</td>
<td>An abbreviation for the project</td>
</tr>
<tr>
<td>Project name</td>
<td>Given name of the project and location</td>
</tr>
<tr>
<td>Customer</td>
<td>Name of the User’s Client or Customer, for whom the calculation is produced</td>
</tr>
<tr>
<td>Calculation title</td>
<td>Specific part of the project the calculation has been made</td>
</tr>
<tr>
<td>Calculation by</td>
<td>The User’s name or initials</td>
</tr>
<tr>
<td>Approved by</td>
<td>Name or initials of the person checking the calculations e.g. internal company or for purposes of a signing-off the calculation</td>
</tr>
<tr>
<td>Remarks</td>
<td>Additional information about the project e.g. references to drawings, specifications, geological report, special instructions/requirements or at the end of the calculation specific instructions resulting from the calculation etc.</td>
</tr>
</tbody>
</table>

6.2 PARTIAL SAFETY FACTORS

The displayed partial safety factors are defaulted to the recommendations contained in TR34 / EN 1992-1-1 or ACI360R-10 or can be user defined. To change the safety factors, click on the drop-down menu and select User.

6.3 SOIL PARAMETERS

Both TR34 and ACI360R-10 specify the structural integrity of the layers below the ground slab in terms of the “modulus of subgrade reaction, k”.

This value shall be provided by the Geotechnical Engineer based on conclusions from the ground investigation and loadings provided by the Structural Engineer.

The software limits the minimum and maximum values which can be inserted.

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>CLAUSE</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR34</td>
<td>5.1</td>
<td>0.015</td>
<td>0.300</td>
<td>N/mm²</td>
</tr>
<tr>
<td>ACI 360R-10</td>
<td>Chapter 4</td>
<td>0.015</td>
<td>0.300</td>
<td>N/mm²</td>
</tr>
<tr>
<td>ACI 360R-10</td>
<td>Chapter 4</td>
<td>55.24</td>
<td>1104.81</td>
<td>PCI</td>
</tr>
</tbody>
</table>

7 LOADINGS

There are three main loading types identified by the Standards:

1. Point loads
2. Material Handling Equipment (MHE)
3. Distributed loads

The TR34 and ACI 360R-10 consider acting loads differently, therefore there is a difference on how the data is input into the software.

If loads are not adequately input an error message will appear and it is not possible to continue to the check and design.
7.1 LOAD COMBINATIONS

The Standards consider forces as individual loads acting on the slab, with the one exception in TR34 where it considers a combined column/upright load in combination with the MHE load.

7.2 LOAD SUMMARY

TR34 loadings (refer to section 4 of Standard)

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>LOAD</th>
<th>DESCRIPTION</th>
<th>LOAD TYPE</th>
<th>INPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR34</td>
<td>Point loads</td>
<td>Automatic load generation</td>
<td>Storage racking</td>
<td>Simple</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manual load input</td>
<td>Mezzanine</td>
<td>Back to back</td>
</tr>
<tr>
<td></td>
<td>Material Handling Equipment</td>
<td>Interaction with column</td>
<td>Single point loads</td>
<td>Permanent</td>
</tr>
<tr>
<td></td>
<td>Distributed Loads</td>
<td>Uniformly Distributed loads</td>
<td>Dual point loads</td>
<td>Variable</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Quadruple point loads</td>
<td>Racking</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Edge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Corner</td>
</tr>
</tbody>
</table>

ACI 360R-10 loadings (refer to Section 11.3.3.3 of Standard)

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>DESCRIPTION</th>
<th>TYPE</th>
<th>LOADING</th>
<th>INPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACI 360R-10</td>
<td>Point loads</td>
<td>Single point loads</td>
<td>Racking</td>
<td>Internal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Moving wheel load</td>
<td>Edge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other</td>
<td>Corner</td>
</tr>
<tr>
<td></td>
<td>Materials Handling Equipment</td>
<td>Wheel data</td>
<td>Contact Pressure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Distributed Loads</td>
<td>Uniformly Distributed loads</td>
<td>Contact Area</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Linerarily distributed loads</td>
<td>Contact Pressure</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Contact Area</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Edge Distance</td>
<td></td>
</tr>
</tbody>
</table>
7.3 BASIC LOAD FUNCTIONS

Loads can be added, copied or deleted using the icons:

- Add a load
- Copy a load
- Delete load

7.4 TR34 LOADING

7.4.1 AUTOMATIC POINT LOAD GENERATION

The User is required to input:

- The total upright load
- Dimensions of the baseplates x and y
- Dimensions A and B
- Check the box if there is a back to back arrangement and add dimension C

The User is required to input:

- The column permanent load
- The column variable load
- Dimensions of the baseplate
- Spacing of the columns
7.4.2 MANUAL POINT LOAD

The User is required to input:
→ The total single load, the total of two dual loads or the total of a four-point load
→ Select if the load is a racking, permanent, dynamic or other load from the drop-down menu
→ The contact dimensions x and y
→ Check at least one or more of the boxes, if the load is acting at an internal, edge or corner location

INTERNAL, EDGE OR CORNER POSITIONS

Single point loads can act at internal edge or corner positions.

The Standard does not contemplate the possibility of considering a dual load in a corner because only one of the two loads will be in the corner. The same applies to quadruple loads by an edge or in a corner. Only two of the four loads are next to an edge or one of the four loads is in the corner. In these situations, the User shall assess how best to simulate the load arrangements.

Possible load positions are illustrated in the diagram.

TR34 section 7.7 defines internal, edge and corner loads in terms of load locations.

Internal – the centre of the load is located more than (a + l) from an edge (i.e. a free edge or a joint)
Edge – the centre of the load is located immediately adjacent to a free edge or joint more than (a + l) from a corner (i.e. a free corner, the intersection of a free edge and a joint, or the intersection of two joints)
Corner – the centre of the load is located a from each of the two edges or joints forming a corner

Where; a = equivalent radius of contact area of the load
l = radius of relative stiffness (refer to section 9.1.3 of this manual)
7.4.3 MATERIAL HANDLING EQUIPMENT

The User is required to input

- The load value for a single wheel
- Select from the drop-down menu the option to a contact area of contact pressure
- Add the contact area or contact pressure value
- Dimension A between wheels (TR34 only)

NOTE: TR34 checks this as a single wheel load and another check as a dual load (to simulate the axle at a distance A). To simulate a front and rear axle, a separate load case must be generated.

7.4.4 UNIFORMLY DISTRIBUTED LOADS

The User is required to input

- Select type of UDL from the drop-down menu specific or unknown
- Add the load value
- For known arrangements add the L, A and B dimensions

NOTE: Section 7.12 of TR34 states either the arrangement of distributed load is known or unknown. When the load arrangement is specific the actual positive and negative slab moments can be calculated. If the load arrangement is unknown the software will determine the worst case positive and negative moment, depending on the slab thickness and concrete class.
The User is required to input

→ The line load value
→ Distance away from an edge

7.5  ACI 360R-10 INPUT LOADING

7.5.1  SINGLE POINT LOAD

The User is required to input

→ The total single load
→ Select if the load is a racking, moving wheel load or other from the drop-down menu
→ The contact dimensions x and y
→ Check at least one or more of the boxes, if the load is acting at an internal, edge or corner location

7.5.2  MATERIAL HANDLING EQUIPMENT

The User is required to input

→ The load value for a single wheel

NOTE: ACI360R-10 only considers a single wheel load does not consider an axle
→ Select from the drop-down menu the option to a contact area of contact pressure
→ Add the contact area or contact pressure value

7.5.3  UNIFORMLY DISTRIBUTED LOADS

The User is required to input

→ Select type of UDL from the drop-down menu specific or unknown
→ Add the load value
NOTE: Section 7.12 of TR34 states either the arrangement of distributed load is known or unknown. When the load arrangement is specific the actual positive and negative slab moments can be calculated. If the load arrangement is unknown the software will determine the worst case positive and negative moment, depending on the slab thickness and concrete class.

→ For known arrangements add the L, A and B dimensions

The User is required to input

→ The line load value
→ Distance away from an edge

7.5.4 WHEEL LOADS

The load value is for one wheel and the value of the area or pressure is for one wheel.

The program checks a wheel as a single load with the defined “wheel load” e.g. 60 kN. TR34 also makes a check considering a dual load, to simulate the axle, with 2 times “wheel load” i.e. 120kN and a distance between loads of “A”.

The report shows only the development of the most unfavourable load case. In this case it is the dual load at the edge, but the two calculations are performed, as it can be seen in the table of checks.
8 CHECK AND DESIGN

8.1 LAYOUT

The layout of the check and design is split into different parts.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Concrete</td>
</tr>
<tr>
<td>B</td>
<td>Fibers</td>
</tr>
<tr>
<td>C</td>
<td>Slab</td>
</tr>
<tr>
<td>D</td>
<td>Reinforcement</td>
</tr>
<tr>
<td>E</td>
<td>Design Wizard</td>
</tr>
<tr>
<td>F</td>
<td>Checking Summary</td>
</tr>
<tr>
<td>G</td>
<td>Strength values</td>
</tr>
</tbody>
</table>

8.1.1 CONCRETE

The concrete class can be changed by selecting another grade in the drop-down menu. In some cases, the fiber dosage and concrete class is fixed, in others this is optional.

For TR34, the concrete class is limited between C20/25 to C40/50 [25 MPa to 50 MPa when tested with 150 x 150 x150 cubes]

The Poisson’s ratio can be changed between values of 0.1 to 0.5.
8.1.2 FIBER

The country defined at the start in the ‘Project Parameters’ will display the available SikaFiber® in the country from the drop-down menu.

The available dosage range for the specific SikaFiber® is displayed by hovering the cursor over the value.

The fiber dosage value can be locked or un-locked in the calculation by clicking on the padlock symbol.

8.1.3 SLAB THICKNESS

The slab thickness is defined by the User. It is restricted to a maximum value and a recommended minimum value from the Standard.

The slab thickness can be locked or un-locked in the calculation by clicking on the padlock symbol.

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>SECTION</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR34</td>
<td>7.1</td>
<td>150</td>
<td>600</td>
<td>mm</td>
</tr>
<tr>
<td>ACI 360R-10</td>
<td>Appendix 1</td>
<td>120</td>
<td>600</td>
<td>mm</td>
</tr>
<tr>
<td>ACI 360R-10</td>
<td>Appendix 1</td>
<td>5</td>
<td>23</td>
<td>inches</td>
</tr>
</tbody>
</table>

8.1.4 JOINTLESS SLAB

The software has the option to turn off the joint spacing check option.

**Selecting “jointless” does not mean the software allows the specification of no joints!**

If jointless is selected, the panel dimensions (TR34) or recommended joint spacing (ACI360R-10) will not be an option. The joint spacing will be reduced to a light grey text and the dimensional check will therefore not be done. In the “other checks” tab, a warning yellow triangle will appear to indicate the check is not requested.

When designing a jointless slab consider edge and corner cases only occur on the periphery of the slab. This needs to be taken into consideration when specifying the load transfer at a joint.

8.1.5 JOINT SPACING

The software gives limited guidance on joint spacing. In the case of “jointed long area” slabs and “long strip” slabs, with the formed joints and the sawn joints, the floor becomes a set of smaller panels. The dimension of these panels is checked in the program. The many factors and construction methods which need to be taken into consideration requires each slab to be considered on a project by project basis. The software does not design project specific joints or the spacing. It only gives spacing guidance according to the Standards.

The User shall refer to the relevant parts of the Standards are TR34 section 11 and chapter 6 of ACI360R-10.

| TR34         | Clause 11.1.1 large area construction sawn restrained-movement joints the slab is typically cut into 6m bays. The User can add the size of the bay and the software will make some checks in accordingly which can be viewed in the results |
ACI 360R-10

For slabs reinforced only for limiting crack widths the software will suggest a joint spacing based on figure 6.6 of the Standard. The User must decide if the concrete is of low, typical or high shrinkage concrete.

8.1.6 LOAD TRANSFER

A typical slab consists of bays divided up by joints. The joint layout is planned based on project specific factors such as building geometry, equipment layout, joint width etc.

Free edges at periphery of building do not tend to transfer shear. However, internal joints can transfer load across a joint, depending on the joint type and according to how it is designed.

The default value for the percentage of load transfer at the edge and corner is zero. The User, depending on the type of joint in consideration can edit that value between 0 to 50%.

The entered value will be the load transfer throughout the calculation. If there are different types of joints, and load transfer, a new calculation is required for the different load case.

When checking a load at the edge or at the corner, part of the load can be transferred through the joint, and therefore, the required load at the edge or corner slab will be less than the specified value. In the case of the internal load this transfer to the joint does not occur.

If a transfer percentage is specified, for example 20%, the load-transfer capacity will be available across the joint. It would be expected that this will be capable of supporting 20% of the load and this information must be conveyed to the responsible joint designer. This reduces the required load capacity to \( P \cdot (1 - 0.20) = P \cdot 0.8 \).

8.1.7 ADDITIONAL REINFORCEMENT

The SikaFiber® software offers the possibility of adding some reinforcement in addition to the fibers. The maximum amount of reinforcement is limited. The ratio is dependent on the bar spacing and slab thickness as shown in the example below.

<table>
<thead>
<tr>
<th>STANDARD</th>
<th>MINIMUM</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bending</td>
<td>0</td>
<td>( \phi 6 @ 200 \text{ mm} )</td>
</tr>
<tr>
<td>Punching</td>
<td>0</td>
<td>( \phi 7 @ 200 \text{ mm (x and y)} )</td>
</tr>
</tbody>
</table>
The maximum limit ratio will automatically change depending on the thickness of the slab.

Calculating the reinforcement ratio
\( \rho (\%) \) is defined as reinforcement ratio for bending (1-direction)

\[
\rho (\%) = \left( \frac{A_s}{b \cdot d} \right) \times 100
\]

Calculation example:
reinforcement H6 at 200mm
\( d = h – \text{cover to bar centre} = 200 – 40 = 160\) mm
\( A_s = \left( \frac{\pi \cdot 6^2}{4} \right) = 28.3 \) mm\(^2\)
\( \rho = \frac{28.3}{200 \cdot 160} = 0.00088 \)
\( \rho (\%) = 0.088 \)

Calculating the punching ratio (2-direction)
\( \rho_1 (\%) \) is defined as reinforcement ratio for punching

\[
\rho_1 = (\rho_x \cdot \rho_y)^{0.5}
\]

\( \rho_x = \frac{A_{sx}}{b \cdot d} \)
\( \rho_y = \frac{A_{sy}}{b \cdot d} \)

Calculation example:
reinforcement mesh H7 at 200mm in X and 200 in Y
\( A_s = \left( \frac{\pi \cdot 7^2}{4} \right) = 38.5 \) mm\(^2\)
\( \rho_x = \frac{38.5}{200 \cdot 153} = 0.00126 \)
\( \rho_y = \frac{38.5}{200 \cdot 160} = 0.00120 \)
\( \rho_1 = (0.00126 \cdot 0.00120)^{0.5} = 0.00123 \)
\( \rho_1 (\%) = 0.123 \)

8.1.8 DESIGN WIZARD

Pressing the design wizard searches the optimum dosage amount and a slab thickness. It will also work if one of either the dosage or thickness is locked, but not if both are locked.
8.1.9 CHECKING SUMMARY

The individual checks for each load case are summarised. The slab capacity is defined as the required ultimate load (Pd) / total failure load (Pu) which must be less than 1. Values with a Pd/Pu < 1 are indicated green, values > 1 are indicated red.

For each checking type the more unfavourable ratio, highest value, is displayed.

Selecting a different ‘checking type’ will change to another view of the summary.

8.1.10 WARNING SYMBOLS

Warning symbols are an advice. Refer to the Standard for further details.

8.1.11 USAGE COEFFICIENTS

Within the green and red box are displayed a ‘usage coefficient’. This is determined from:

Usage Coefficient = Ultimate load / slab capacity

If a red cross and value of 1.7987 is displayed, it means the slab capacity is exceeded by 79.9 %
If a green tick and value of 0.6212 is displayed, it means there is 37.9 % capacity remaining.

8.1.12 LCNP

A LCNP denotes where the Load Cases are Not Possible.
Single loads are possible in corners, edges and at internal bay locations. The Standard does not contemplate the possibility of considering a dual load in a corner because only one of the two loads will be in the corner. The same applies to quadruple loads by an edge or in a corner. Only two of the four loads are next to an edge or one of the four loads is in the corner. In these situations, the User shall assess how best to simulate the load arrangement according to the requirements.

Possible load positions are illustrated in the diagram.

If the check does not pass there are several options to the User. The solution could be, and not limited to:

I. Increase slab thickness (locally or generally)
II. Increase concrete grade
III. Change fiber dosage
IV. Reduce the load
V. Move the load away from the affected edge or corner
VI. Change the joint load transfer (designed joint)
VII. A combination of the above

STRENGTH VALUES

The flexural tensile and residual strength used in the calculation are summarised. These values come from testing and relate to the concrete grade and fiber dosage.

9 RESULTS

The results window displays for each load case the required ultimate load (Pd) and total failure load (Pu). The load case can be changed by selecting the pull-down menu.
9.1 SLAB CAPACITY CHECK

The results display the Pd and Pu values. The Pd value is defined as the input load multiplied by the relevant factor of safety.

The printout will display how the calculations were derived for only one of the load locations. The load calculation selected for the printout is the check with least remaining slab capacity.

9.2 RADIUS OF RELATIVE STIFFNESS

The program calculates the "radius of relative stiffness" and the "equivalent radius of contact area" to perform the checking calculations, as can be seen in the report.

In addition, in the “Results” screen, the program provides the “radius of relative stiffness” as informative data and draws the corresponding bands on the panel of dimensions given by the User.

This is information for the user, since there are loads that are automatically calculated at the three positions: interior, edge and corner, but there are other loads whose position will be dictated by the user.

The program does not analyse if the load is at a distance from the edge less than “l” or greater than "(a + l)", it only provides the data of “a” and “l”.

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10 PRINTOUT

The main features of the printout are:

- Optional summarised or complete report
- Printer setup
- Search function
- Export to different formats

10.1 SUMMARISED REPORT

The summarised report contains:

- Project information
- Product proposal
- Design summary
- Loading summary
- Design data
- Result summary

10.2 COMPLETE REPORT

In addition, the complete report contains:

- Slab capacity calculations
- Bending checks
- Punching checks
- Line load checks
- Uniform distributed load checks
- Other verifications

Only the complete development of the most unfavorable check of each group of checks is shown in the printout. This is to keep the report within a reasonable number of pages.
In order to see a specific check, enter loads in a separate project and use the manual load input tool to place them only in the desired position.

10.3 PRINTER SETUP
Set up to a printer using the configure option, paper size and to set up the margins

10.4 SEARCH FUNCTION
Use the search function to find quickly a formula, phrase or word in the calculation.

10.5 EXPORTING TO DIFFERENT FORMATS
The calculation printout can be exported into different formats by selecting the format icon in the top right corner.

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