

Get Free  
Punching Shear  
Strength Of  
Interior  
Concrete Slab  
Column  
Strength Of  
Interior  
Concrete  
Slab Column

If you ally  
compulsion such  
a referred  
**punching shear**

Get Free  
Punching Shear  
**Strength of  
interior  
concrete slab  
column** ebook

that will come  
up with the  
money for you  
worth, get the  
certainly best  
seller from us  
currently from  
several  
preferred  
authors. If you

# Get Free Punching Shear

want to funny  
books, lots of  
novels, tale,  
jokes, and more  
fictions  
collections are  
moreover  
launched, from  
best seller to  
one of the most  
current  
released.

You may not be

# Get Free Punching Shear

perplexed to  
enjoy all book  
collections  
punching shear  
strength of  
interior  
concrete slab  
column that we  
will completely  
offer. It is not  
regarding the  
costs. It's  
approximately  
what you

# Get Free Punching Shear

infatuation of  
currently. This  
punching shear  
strength of  
interior  
concrete slab  
column, as one  
of the most full  
of life sellers  
here will  
completely be in  
the course of  
the best options  
to review.

# Get Free Punching Shear Strength Of

Punching shear  
of interior  
column Physics -

**Mechanics:**

Stress and  
Strain (12 of  
16) Ex. 3: Punch  
Hole in Steel  
Plate Punching

Shear in

Foundation

\u0026 Slab with

3D Animation

# Get Free Punching Shear

Strength Shear |

Two way Shear |

Punching Shear  
in footing | Two

way Shear in

footing Punching

Shear SAFE 2016

Tutorial -

Example and

Practical Theory

Shear

~~Reinforcement in~~

~~Flat Slabs |~~

~~Punching Shear |~~

Get Free  
Punching Shear  
shear  
Reinforcement in  
beam

---

Punching Shear -  
Columns near  
slabs of  
different  
thickness

Punching Shear

*Two Way*

*(Punching) Shear*

*- Concept*

*Explained and*

*Flat Plate*



# Get Free Punching Shear

*Example* - CSA

A23.3 (*Canadian  
Code*) Pablo  
Fernández |

Effects of  
unidirectional  
tensile stresses  
on punching  
shear strength  
of RC slabs CE  
414 Lecture 14:  
Bolt  
Shear/Bearing  
Capacity \u0026

Get Free  
Punching Shear  
Strength Of  
Requirements  
(2020.02.14)  
Part 3

Rectangular  
Footings:  
Checking for the  
Punching Shear  
Strength  
(Reinforced  
Concrete) **Why  
Concrete Needs  
Reinforcement**  
~~Part 1~~

~~Get Free  
Punching Shear  
Strength of  
Rectangular  
Footings w/  
Interior  
Moment: Solving  
Concrete Slab  
for Soil Net and  
Column  
Gross Pressure  
(Reinforced  
Concrete)~~

---

Shear Strength  
of a Threaded  
Fastener -  
Fastening Theory  
Part 5 **Full Steel  
detail of Slab  
of Dubai villa**

# Get Free Punching Shear

**according to**

**drawing** Overview  
of normal and  
shear stress

Design of Mat in

15 Minutes with

Special Tips to

Avoid Excessive

Punching Shear-

Part1 RCD:—

Single column

footing design

RCD: Design of

a Square

Get Free  
Punching Shear  
reinforced  
concrete column  
based on ACI  
codes part 1/2

Adhesive Lap  
Joint Shear  
Strength Test -  
Similar to ASTM  
D1002 Bearing  
Capacity Of Soil  
| Bearing  
capacity of  
Different types  
of soil |

# Get Free Punching Shear

Strength of  
Strength of  
Reinforced  
Concrete Slabs

by Various  
Geometry Punches  
| Vlad

Shekhovtsov  
~~Punching shear~~  
~~analysis~~ Flat  
Slab Part 2

:Punching Shear  
Strength

Analysis \u0026

# Get Free Punching Shear

Strength Of

Punching shear  
reinforcement

lesson-19 SLB 15

- Punching Shear

Modes of Soil

Failure | Shear

Failure | Local

Shear Failure |

Punching Shear

Failure PART 3:

Design/Analysis

of Footings -

Gross and Net

# Get Free Punching Shear

*Soil Pressure*

*(REINFORCED*

*CONCRETE )*

*Reinforced*

*Concrete Shear*

*Design Example*

*Problem **Punching***

**Shear Strength**

**Of Interior**

, the punching

shear strength

of FRC

slab-column

connections can



# Get Free Punching Shear

Strength Of  
Interior  
Concrete Slab  
Column  
be defined as

$$(17) V_u = 0.9 f_t [0.9 f_t + (\frac{A_c}{A_c + V_{fr}} - \frac{1}{3}) \cdot f_{cf}]$$

Finally, to address the size effect of punching shear strength reported by a few researchers, a size effect factor  $\beta$

# Get Free Punching Shear Strength Of Interior Concrete Slab Column

$s [ = 400 / d \ 4$   
(mm) ] specified  
in BS 8110 was  
used.

**Punching shear  
strength of  
interior  
concrete  
slab-column ...**

The novel  
premise that the  
punching shear  
strength of flat

Get Free  
Punching Shear  
Strength Of  
slabs at  
connections to  
interior columns  
Concrete Slab  
is controlled by  
Column  
the inclination  
of the failure  
surface shows  
remarkable  
agreement with  
the results of  
209 tests on  
isolated  
specimens  
reported in the

**Get Free**  
**Punching Shear**  
**literature.** This  
paper also  
assesses the  
adequacy of  
strength  
predictions  
obtained using  
the proposed  
method and the  
methods adopted  
in the codified  
provisions.

**Punching shear**

*Page 20/90*

# Get Free Punching Shear Strength of RC flat slabs at interior ...

According to ACI  
Code, the  
punching shear  
strength is  
taken as the  
smallest of the  
following

equations: (7)  $V_u = 0.083 (2 + 4 \rho_c) \rho_c f_c b_0 d$   
(8)  $V_u =$

# Get Free Punching Shear

$0.083 (2 + \frac{f_s d}{b_0}) \frac{f_c}{b_0}$

$d (9) V_u =$

$0.083 \times 4 \frac{f_c}{b_0}$

$\frac{f_c}{b_0}$  where  $\gamma$

is the

modification

factor

reflecting the

reduced

mechanical

properties of

lightweight

concrete,  $\gamma = 1$

# Get Free Punching Shear

Strength Of  
concrete;  $b_0$  is  
the rectangular  
critical Slab  
perimeter at a  
distance of  $0.5$   
 $d$  from the face  
of a column,  
that is  $4(c +$   
 $d)$ ;  $c$  is the ...

**Punching shear  
strength of  
interior**

# Get Free Punching Shear

**slab-column** . . .

@article{Esfahan  
i2009PunchingSS,  
title={Punching  
shear strength  
of interior  
slab-column  
connections  
strengthened  
with carbon  
fiber reinforced  
polymer sheets},  
author={M. R.  
Esfahani and M.



# Get Free Punching Shear

R. Kianoush and  
A. Moradi}, jour  
nal={Engineering  
Structures},  
year={2009},  
volume={31},  
pages={1535-1542  
...

**Punching shear  
strength of  
interior  
slab-column ...**

A method to

# Get Free Punching Shear

Strength of  
evaluate the  
punching shear  
strength of  
reinforced  
concrete (RC)  
flat slabs  
without shear  
reinforcement at  
the connection  
to interior  
columns is  
proposed. The  
method is based  
on the ass...

# Get Free Punching Shear Strength Of

**Punching shear  
strength of RC  
flat slabs at**

**interior ...**

reported  
punching shear  
strength in  
tests). Hallgren  
(1996) reported  
that an increase  
in concrete  
strength ( $f_c$ )  
from 25 MPa to

# Get Free Punching Shear

90MPa for a  
flexural  
reinforcement  
ratio of 0.8%  
brought a  
significant  
increase  
(50-60%) in  
punching shear  
strength  
whereas, for a  
low  
reinforcement  
ratio ( $\rho = 0.3\%$ )

# Get Free Punching Shear the Strength Of corresponding increase was 20% (Figure 3). Concrete Slab Column

**Punching shear  
strength of RC  
flat slabs at  
interior ...**

Punching Shear  
Strength of GFRP-  
RC Interior  
Slab-Column  
Connections

Get Free  
Punching Shear  
Strength Of  
Subjected to  
Moment Transfer  
Interior  
... Punching-  
Concrete Slab  
Shear Strength  
Column  
of Normal and  
High-Strength  
Two-Way Concrete  
Slabs Reinforced  
with GFRP Bars.  
Journal of  
Composites for  
Construction  
September 2013 .

# Get Free Punching Shear

## **Strength Of Strength of GFRP- RC Interior Slab-Column ...**

The punching shear capacity of an interior slab-column connection can be determined on the basis of the flat slab model as a sum of capacities of

Get Free  
Punching Shear  
Strength Of  
Interior  
Concrete Slab  
Column

two orthogonal  
beams of spans  $L_1$   
and  $L_2$  (Fig.  
1 ),

**(PDF) Punching  
Shear Capacity  
of Interior SFRC  
Slab-Column ...**

DOI: 10.1680/IIC  
EP.1987.224

Corpus ID:  
108699656.

PREDICTING THE



# Get Free Punching Shear

ENHANCED  
PUNCHING  
STRENGTH OF  
INTERIOR SLAB-  
COLUMN

CONNECTIONS. @in  
proceedings{Rank  
in1987PREDICTING  
TE, title={PREDI  
CTING THE  
ENHANCED  
PUNCHING  
STRENGTH OF  
INTERIOR SLAB-

# Get Free Punching Shear

COLUMN  
STRENGTH OF  
CONNECTIONS. } ,  
author={G.  
Rankin and A.  
Long} ,  
year={1987} }

**PREDICTING THE  
ENHANCED  
PUNCHING  
STRENGTH OF  
INTERIOR SLAB**

...

These give the

# Get Free Punching Shear

distance from  
the shear  
perimeter edge  
to the centroid  
of the shear  
perimeter. For  
an interior  
punching shear  
perimeter this  
will always be  
 $L1/2$  or  $L2/2$ .  
For edge and  
corner cases  
this value is

Get Free  
Punching Shear  
Strength Of  
the moment of  
Interior  
area of the  
Concrete Slab  
shear  
perimeter/area  
Column  
of the sides.

Note:

## **Punching Shear - Design**

Shear force of  
steel and bolts.  
Here follows a  
short example of

# Get Free Punching Shear

how to work out  
the shear force  
of a piece of  
steel. The

factor of 0.6  
used to change  
from tensile to  
shear force  
could vary from  
0.58-0.62 and  
will depend on  
application.

Steel called EN8  
bright has a

Get Free  
Punching Shear  
Strength of  
Interior  
Concrete Slab  
Column  
tensile strength  
of 800 MPa and  
mild steel has a  
tensile strength  
of 400 MPa.

**Shear force -  
Wikipedia**

Shear Punching  
Strength. The  
shear punching  
strength of  
conventional  
slab-column

Get Free  
 Punching Shear  
 Strength of  
 square or  
 circular columns  
 can be predicted  
 from Eqs. or  
 respectively:

Square columns:

$$(37) P_{vs} = 1.37 f_c \left( \frac{A_c}{d} + \frac{d}{100} \right) + 0.45 A_s f_y$$

$$d \leq 0.18 \text{ m}$$

Circular

columns: (38)  $P_{vs} = 1.25 f_c \left( \frac{A_c}{d} + \frac{d}{100} \right) + 0.45 A_s f_y$

# Get Free Punching Shear Strength Of Interior Concrete Slab Column

$$\phi V_c = 0.45 \left( \frac{f_c}{100} \right) \left( \frac{A_c}{s} \right) d$$
$$\phi V_c = 0.05 \left( \frac{f_c}{100} \right) \left( \frac{A_c}{s} \right) d$$
$$\phi V_c = 0.18 \left( \frac{f_c}{100} \right) \left( \frac{A_c}{s} \right) d$$

**Punching  
strength of  
conventional  
slab-column  
specimens ...**

In ACI 318-08,  
the punching  
shear strength  
[ ] is defined to



# Get Free Punching Shear

Strength of  
Interior  
Concrete Slab  
Column

be about two  
times the one-  
way shear  
strength of  
reinforced  
concrete slender  
beams. In  
contrast, BS  
8110 and  
Eurocode 2  
define the  
punching shear  
strength of the  
slab-column

**Get Free**  
**Punching Shear**  
connection to be  
the same as the  
shear strength  
of reinforced  
concrete slender  
beams.

**Strain-based**  
**strength model**  
**for direct**  
**punching shear**  
**of ...**

This paper  
presents the

# Get Free Punching Shear

Strength Of an  
experimental  
investigation  
undertaken to  
evaluate the  
punching shear  
capacity of  
interior  
slab-column  
connections,  
strengthened  
using flexible  
carbon fiber-  
reinforced

# Get Free Punching Shear

polymer (CFRP)  
sheets. Sixteen  
square  
(670×670mm)

slab-column  
connections with  
different slab  
thicknesses (55  
and 75 mm) and  
reinforcement  
ratios (1 and  
1.5%) were  
tested.

Get Free  
Punching Shear  
Strength Of  
Strengthening of  
Interior  
Concrete Slab  
Column  
Connections ...

Therefore, in this study, a punching shear strength model of the steel-fiber-reinforced concrete two-way flat slab is proposed. In

# Get Free Punching Shear

Strength Of the  
total shear  
resistance of  
the steel-fiber-  
reinforced  
concrete flat  
slab is  
expressed by sum  
of the shear  
contribution of  
steel fibers in  
the cracked  
tension region  
and that of

# Get Free Punching Shear Strength Of Interior Concrete Slab Column

**Consideration on  
punching shear  
strength of  
steel-fiber ...**

In comparison  
with already  
known formulas,  
the proposed  
punching shear

# Get Free Punching Shear

Strength of  
Interior  
Concrete Slab  
Column  
model seems to  
have better  
agreement with  
test results and  
provides  
predictions of  
the punching  
shear capacity  
with the...

**(PDF) A NEW  
PUNCHING SHEAR  
DESIGN FORMULA  
FOR FRP ...**



# Get Free Punching Shear

Strength Of  
61 HSC interior  
slab-column  
connection Slab

Column  
specimens were  
collected from  
the literature.  
The available  
test results  
were not only  
compared with  
current code  
provisions but  
with equations

**Get Free**  
**Punching Shear**  
Strength by  
other  
Interior  
researchers as  
Concrete Slab  
well. A new  
Column  
formula for  
predicting  
punching shear  
strength of HSC  
interior slab-  
column  
connections is  
proposed.

**Prediction of**

*Page 50/90*

# Get Free Punching Shear Strength of Strength of HSC interior slab Concrete Slab

The critical section adopted by the Eurocode 2, EC2 , lies at  $2d$  from the column face, and the ultimate punching shear is calculated as follow: (7a)  $P_u$

# Get Free Punching Shear

$= 0.18 \sqrt{f_c}$

$\sqrt{1 / 3} K b_o, EC$

$d$  where  $\rho$  is  
the flexural

reinforcement

ratio which is

limited to the

maximum of 2%,

and  $K$  is a

factor

accounting for

the size effect

that is defined

as: (7b)  $K = 1 +$

# Get Free Punching Shear

(200 / d)  $\leq$  2.0

In case of shear reinforcement,  
the punching

strength can be  
calculated as:

$$(8a) \quad P_u = 0.135$$

$$100 \leq f_c \leq 1 /$$

$$3 \quad K_b \quad o \quad \dots$$

# Get Free Punching Shear Strength Of Interior

"This study experimentally explores the suitability of Synthetic Fiber-Reinforced Concrete (SNFRC) as a feasible method for improving the punching shear strength of two-

# Get Free Punching Shear

Strength Of  
Interior  
Concrete Slab  
Column

way slabs. The investigation involved interior flat slab panels made with two synthetic fiber volumetric percentages, as well as three spacing configurations for the flexural reinforcement.

# Get Free Punching Shear

Nine full-scale,  $2\text{m} \times 2\text{m} \times 0.15\text{m}$  slabs, are utilized to quantify the SNFRC impact on punching shear strength, toughness and deformation capacity. The nine slabs are divided into three groups of



# Get Free Punching Shear

fiber volumetric  
content: 1.25%,  
0.75% and 0%.

Each group  
consists of  
three flexural  
steel  
reinforcement  
spacing

configurations:  
16mm-diameter  
rebars at 60mm,  
80mm and 110mm.

For SNFRC

# Get Free Punching Shear

material character  
erization,  
compressive  
strength and  
tensile rupture  
strength are  
captured via  
standard  
150\*150\*150mm  
cubes and  
150\*150\*500mm  
rectangular  
prisms,  
respectively.

# Get Free Punching Shear

Material  
characterization  
revealed that  
the introduction  
of synthetic  
fibers had a  
negligible  
impact on the  
compressive  
strength. A  
reduction of  
merely 3.4% and  
2.3% is  
associated with

# Get Free Punching Shear

adding 1.25% and  
0.75% fiber  
content,  
respectively.

Conversely, the  
three-point  
loading test  
results in 14%  
and 4% higher  
rupture tensile  
strengths  
associated with  
1.25% and 0.75%  
fiber contents.

# Get Free Punching Shear

Moreover, the introduction of synthetic fiber dosages of 1.25% and 0.75% resulted in considerable improvement to the punching shear strength, 36% and 15%, respectively. The greatest effect of the

# Get Free Punching Shear

Strength Of  
Interior  
Concrete Slab  
Column  
capacity and  
toughness  
(quantified as  
the area under  
the load-  
deflection  
curve). For the  
0.75% fibers  
group, the  
improvement

# Get Free Punching Shear

Strength of 67%  
to 274%

associated with  
the 60mm the

110mm spacing,  
respectively.

Similarly, for  
the 1.25% group,  
the

corresponding  
counterparts  
have an

improvement  
range of 82% to

# Get Free Punching Shear

Strength For

comparison  
purposes,  
several

analytical  
predictions for  
the punching  
shear strength  
are made in  
accordance to  
the CEB-FIB 2010  
Model Code,  
ACI-318, ACI-544  
codes as well as



# Get Free Punching Shear

Strength Of  
Interior  
Concrete Slab  
Column

models available  
in the  
literature. One  
particular model  
is found to best  
agree with SNFRC  
slabs when it is  
re-calibrated in  
this study. The  
re-calibration  
utilized the  
differences in  
the steel and  
synthetic fibers

# Get Free Punching Shear

Strength Of  
mechanical  
properties.

Namely, Young's  
modulus, the  
tensile strength  
and fiber-  
concrete bond st  
rength."--Abstra  
ct.

Punching is  
considered to be  
one of the most  
difficult

Get Free  
Punching Shear  
Strength in  
structural  
concrete design  
and mechanical  
models or  
theoretical  
analyses were  
developed rather  
late in the  
history of  
concrete  
research  
attempts. This  
fib Bulletin

Get Free  
Punching Shear  
Strength of  
Interior  
Concrete Slab  
Column  
reviews the  
development of  
design models  
and theoretical  
analyses since  
the CEB Bulletin  
168 Punching  
Shear in  
Reinforced  
Concrete - State-  
of-the-Art  
Report published  
in 1985. The  
role of the

Get Free  
Punching Shear  
Strength Of  
concrete tensile  
strength was  
specially  
addressed. In  
this respect the  
present bulletin  
is also  
following-up the  
CEB Bulletin 237  
Concrete Tension  
and Size Effects  
- Utilisation of  
concrete tension  
in structural

# Get Free Punching Shear

Strength Of  
concrete design  
and relevance of  
size effect -  
Contributions  
from CEB Task  
Group 2.7

published in  
1997. Apart from  
new theoretical  
developments a  
comprehensive  
databank for  
comparisons with  
experimental

Get Free  
Punching Shear  
Strength of  
evidence is  
included. About  
400 punching  
tests were  
critically  
reviewed and  
evaluated in a  
consistent  
manner. This is  
thought to be  
the first step  
towards a  
generally agreed  
selection of

# Get Free Punching Shear

Strength tests.

The evident  
value of such a  
data bank is

illustrated by  
comparisons  
carried out  
between the data  
and some of the  
analytical  
proposals as  
well as  
empirical code  
formulas. List



# Get Free Punching Shear Strength Of

- (1) Introduction,
- (2) Code Equations, (3) Mechanical models for punching, (4) New developments for mechanical models, (5) Numerical investigations,
- (7) Comparison

# Get Free Punching Shear

Strength Of  
models and test  
results of slabs  
without shear

reinforcement,

(8) Comparison

of code rules

and tests of

flat slabs

without shear

reinforcement,

(9) Comparison

of codes, models

and tests of

# Get Free Punching Shear

Strength Of  
Interior  
Concrete Slab  
flat slabs with  
shear  
reinforcement,  
(10)

Experimental  
investigations,  
(11) Summary and  
conclusions,  
References,  
Appendices : (I)  
Databank on  
slabs without  
shear  
reinforcement,

# Get Free Punching Shear

(II) Databank on  
slabs with shear  
reinforcement,  
(III) Comparison  
of test data  
with code rules,  
(IV) Comparison  
of test data  
with selected  
models, (V)  
Notations.

Civil

Engineering and

*Page 76/90*

# Get Free Punching Shear

Strength Of  
Interior  
Concrete Slab  
Column

Urban Planning  
IV includes the  
papers presented  
at the 4th

International  
Conference on  
Civil

Engineering and  
Urban Planning  
(CEUP 2015,  
Beijing, China,  
25-27 July  
2015). The  
contributions

# Get Free Punching Shear

Strength Of  
Interior  
Concrete Slab  
from experts and  
world-renowned  
scientists cover  
a wide variety

of topics: -

Civil

engineering; -

Architecture and  
urban planning;

- Transpor

Advances in

*Page 78/90*

# Get Free Punching Shear Strength Of Engineering and Building Materials

presents the  
state-of-the-art  
development in:

- Structural  
Engineering -  
Road & Bridge  
Engineering -  
Geotechnical  
Engineering -  
Architecture &

# Get Free Punching Shear

Urban Planning -

Transportation

Engineering -

Hydraulic Slab

Engineering -

Engineering

Management -

Computational

Mechanics -

Construction

Technology -

Building

Materials -

Environmental



Get Free  
Punching Shear  
Engineering -  
Computer  
Simulation -  
CAD/CAE Emphasis  
was given to  
basic  
methodologies,  
scientific  
development and  
engineering  
applications.  
Advances in  
Civil  
Engineering and

Get Free  
Punching Shear  
Strength Of  
Materials will  
be useful to  
professionals,  
academics, and  
Ph.D. students  
interested in  
the above  
mentioned areas.

Advances in  
Concrete Slab  
Technology  
documents the

Get Free  
Punching Shear  
Strength of  
the  
International  
Concrete Slab  
Conference on  
Concrete Slabs  
held at Dundee  
University on  
April 3-6, 1979.  
This book  
discusses the  
influence of  
steel fiber-  
reinforcement on  
the shear

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Punching Shear  
Strength of slab-  
column  
connections;  
sulfur-treated  
concrete slabs;  
yield line  
analysis of  
orthotropically  
reinforced  
exterior panels  
of flat slab  
floors; and  
behavior of flat  
slab/edge column

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Strength Of  
Interior  
Concrete Slab  
Column  
joints. The  
design of  
multiple panel  
flat slab  
structures;  
structural  
behavior of  
floor slabs in  
shear wall  
buildings;  
shrinkage and  
cracking of  
concrete at  
early ages; and

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Strength Of  
construction for  
HAB system

Interior  
Concrete Slab  
modules are also  
elaborated. This

Column  
text likewise  
covers the  
direct finishing  
of concrete

slabs using the  
early age power  
grinding

technique;  
application of

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vacuum  
dewatering to in-  
situ slab  
production;

retexturing of  
concrete slabs;  
and fatigue  
resistance of  
composite

precast and in  
situ concrete  
floors. This  
publication is a  
good reference

Get Free  
Punching Shear  
for students and  
individuals  
concerned with  
the practices  
and research  
relating to slab  
technology.

Topics covered  
within this set  
of conference  
proceedings



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Strength Of  
structural  
analysis -  
theory and  
methods;  
structural  
design -  
concept,  
technique and  
codes of  
practice;  
structural forms  
- concept and  
application; and

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Construction of  
structures.

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