

**SCADDS/RC-Slab Designer 2007 [ Release: 3.01.1001 ]**

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**Limit State Design of R.C.C. One Way/Two Way  
Rectangular/Square Slabs & Trapezoidal/Triangular Slabs  
and Circular/Hexagonal/Octagonal Slabs  
with Simple/Fixed/Continuous/Cantilever Supports  
in accordance with IS:456-2000 and IS:875-1987(Part-2).**

**INTRODUCTION**

This Report contains detailed design solutions for Reinforced Concrete Slabs.

The R.C.C. Slabs are considered for Flexural Design, Shear and Deflection and the output contains the following portions:

1. Global Input Data
2. Flexural Design Output
3. Shear Check Output
4. Deflection Check Output
5. Development Length / Bond Design Output

While detailed design is carried out for Flexure, only checks are made for items 3 and 4.

**GLOBAL MATERIAL DATA**

Concrete Clear Cover	=	20	mm.
Char. Comp. Strength of Concrete	=	20	N/sq.mm.
Yield Strength of Main Steel	=	415	N/sq.mm.
Main Rod Size-0	=	8	mm.
Main Rod Size-1	=	10	mm.
Yield Strength of Secondary Steel	=	415	N/sq.mm.
Secondary Rod Size-0	=	8	mm.
Secondary Rod Size-1	=	10	mm.
Yield Strength of Torsion Steel	=	415	N/sq.mm.
Torsion Rod Size-0	=	8	mm.
Torsion Rod Size-1	=	10	mm.
Factor of Safety for Load	=	1.5	
Partial Safety Factor for Concrete	=	1.5	
Partial Safety Factor for Steel	=	1.15	
Max. Strain in Concrete	=	0.0035	mm./mm.
Max. Strain in Steel	=	0.0055	mm./mm.
Young's Modulus of Concrete	=	22360.68	N/sq.mm.
Young's Modulus of Steel	=	200000	N/sq.mm.
Total Number of Slab Panels	=	18	

**BOND / DEVELOPMENT LENGTH OUTPUT**

Char. Comp. Strength of Concrete	=	20	N/sq.mm.
Yield Stress of Main Steel	=	415	N/sq.mm.
Yield Stress of Secondary Steel	=	415	N/sq.mm.

**As Per IS:456-2000, Clause 26.2.1.1,**

Design Bond Stress for Main Rods	=	1.92	N/sq.mm.
Design Bond Stress for Secondary Rods	=	1.92	N/sq.mm.

**Rods in Tension**

Main Rod Diameter-1	=	8	mm.
Corresponding Development Length	=	376.094	mm.
Main Rod Diameter-2	=	10	mm.
Corresponding Development Length	=	470.117	mm.
Secondary Rod Diameter-1	=	8	mm.
Corresponding Development Length	=	376.094	mm.
Secondary Rod Diameter-2	=	10	mm.
Corresponding Development Length	=	470.117	mm.

**S01 - PANEL INPUT**

Slab Number	=	S01	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	3	m.
Effective Short Span	=	2.835	m.
Effective Long Span	=	3.835	m.

**Support Type : Interior Panel**  
**It is a Two way Slab.**

Initial Thickness of Slab	=	125	mm.
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**Type of Building is "Mercantile Building"**  
**Type of Floor is "Retail Shops"**

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

**S01 - FLEXURE OUTPUT**

<b>Slab Identification Number</b>	=	<b>S01</b>	
Effective Short Span	=	2.835	m.
Effective Long Span	=	3.835	m.
Long Span to Short Span Ratio	=	1.353	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	41.598	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			
<b><u>Short Span Reinforcement over Centre Portion</u></b>			
Coefficient, alphaX-positive	=	0.038	
Short Span Positive Moment	=	3.654	KN m.
<b>Short Span Positive Steel</b>	=	<b>120</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	418.879	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	654.498	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
<b><u>Short Span Reinforcement over Support Portion</u></b>			
Coefficient, alphaX-negative	=	0.049	
Short Span Negative Moment	=	4.775	KN m.
<b>Short Span Negative Steel</b>	=	<b>136.157</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	369.173	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.

Required Spacing along Short Span (-)	=	576.834	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	2.333	KN m.
<b>Long Span Positive Steel</b>	=	<b>108</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	465.421	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Support Portion

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	3.111	KN m.
<b>Long Span Negative Steel</b>	=	<b>108</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	465.421	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Edge Strip Reinforcement along Short Span

Width of Edge Strip for Short Span	=	0.375	m.
<b>Area of Steel Required</b>	=	<b>56.25</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### Edge Strip Reinforcement along Long Span

Width of Edge Strip for Long Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
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Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided.  
This is done in accordance with IS:456-2000 Clause 26.3.3.*

#### S01 - SHEAR CHECK

Effective Short Span	=	2.835	m.
Effective Long Span	=	3.835	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	20.577	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	17.147	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	20.577	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	17.147	KN.
<b>Maximum Design Shear</b>	=	<b>20.577</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.206	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.275	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that 0.206 &lt; 0.275 and 0.206 &lt; 2.794. The Slab Panel is SAFE in Shear.</b>			

#### S01 - DEFLECTION CHECK

Effective Short Span	=	2.835	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>28.35</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	

*Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.*

<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	2	
<b>Allowable Span to Depth Ratio</b>	=	<b>64</b>	<b>&gt; 28.35</b>
<b>Deflection Requirements are O.K.</b>			

#### S02 - PANEL INPUT

Slab Number	=	S02	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	5	m.
Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
<b>Support Type : Interior Panel</b> <b>It is a Two way Slab.</b>			
Initial Thickness of Slab	=	125	mm.
<b>Type of Building is "Mercantile Building"</b> <b>Type of Floor is "Retail Shops"</b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

#### S02 - FLEXURE OUTPUT

<b>Slab Identification Number</b>	=	<b>S02</b>	
Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
Long Span to Short Span Ratio	=	1.257	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>

### Loads on the Slab Panel

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	54.747	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			

### Short Span Reinforcement over Centre Portion

Coefficient, alphaX-positive	=	0.034	
Short Span Positive Moment	=	6.262	KN m.
<b>Short Span Positive Steel</b>	=	<b>180.262</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	278.847	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>275</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	435.698	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

### Short Span Reinforcement over Support Portion

Coefficient, alphaX-negative	=	0.045	
Short Span Negative Moment	=	8.27	KN m.
<b>Short Span Negative Steel</b>	=	<b>241.25</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	208.354	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>200</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	325.553	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

### Long Span Reinforcement over Support Portion

Coefficient, $\alpha_Y$ -negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

### Edge Strip Reinforcement along Short Span

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>
Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>
Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

### Edge Strip Reinforcement along Long Span

Width of Edge Strip for Long Span	=	0.625	m.
<b>Area of Steel Required</b>	=	<b>93.75</b>	<b>sq.mm.</b>
Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>
Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided.  
This is done in accordance with IS:456-2000 Clause 26.3.3.*

### **S02 - SHEAR CHECK**

Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.

<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.354	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that 0.282 &lt; 0.354 and 0.282 &lt; 2.794. The Slab Panel is SAFE in Shear.</b>			

#### S02 - DEFLECTION CHECK

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	1.628	
<b>Allowable Span to Depth Ratio</b>	=	<b>52.109</b>	<b>&gt; 38.85</b>
<b>Deflection Requirements are O.K.</b>			

#### S03 - PANEL INPUT

Slab Number	=	S03
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Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	7	m.
Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.

**Support Type : Interior Panel**  
**It is a Two way Slab.**

Initial Thickness of Slab	=	125	mm.
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**Type of Building is "Mercantile Building"**  
**Type of Floor is "Retail Shops"**

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

### S03 - FLEXURE OUTPUT

<b>Slab Identification Number</b>	=	<b>S03</b>	
Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
Long Span to Short Span Ratio	=	1.772	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	63.242	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			

### Short Span Reinforcement over Centre Portion

Coefficient, alphaX-positive	=	0.045	
Short Span Positive Moment	=	8.281	KN m.
<b>Short Span Positive Steel</b>	=	<b>241.583</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	208.067	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>200</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	325.105	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

### Short Span Reinforcement over Support Portion

Coefficient, alphaX-negative	=	0.06	
Short Span Negative Moment	=	11.036	KN m.
<b>Short Span Negative Steel</b>	=	<b>328.16</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	153.174	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>150</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	239.334	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>225</b>	<b>mm.</b>

### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

### Long Span Reinforcement over Support Portion

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

### Edge Strip Reinforcement along Short Span

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

**Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.875	m.
<b>Area of Steel Required</b>	=	<b>131.25</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided.*

*This is done in accordance with IS:456-2000 Clause 26.3.3.*

**S03 - SHEAR CHECK**

Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>

**As Per IS:456-2000, Clause 40.1,**  
Actual Shear Stress = 0.282 N/sq.mm.

**As Per IS:456-2000, Table 19,**  
Design Shear Strength of Concrete = 0.403 N/sq.mm.

**As Per IS:456-2000, Table 20,**  
Max. Permissible Shear Stress = 2.794 N/sq.mm.

**It can be seen that  $0.282 < 0.403$  and  $0.282 < 2.794$ .  
The Slab Panel is SAFE in Shear.**

#### S03 - DEFLECTION CHECK

Effective Short Span = 3.885 m.

Effective Depth of Slab = 100 mm.

**Actual Span to Depth Ratio = 38.85**

**As Per IS:456-2000, Clause 24.1,**  
Factor Alpha = 32

*Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.*

**As Per IS:456-2000, Clause 23.2.1.b,**  
Factor Zigma = 1

**As Per IS:456-2000, Clause 23.2.1.c,**  
Factor Gamma = 1.433

**Allowable Span to Depth Ratio = 45.871 > 38.85**

**Deflection Requirements are O.K.**

#### S04 - PANEL INPUT

Slab Number = S04

Slab Shape = Rectangular

Centre to Centre Short Span = 4 m.

Centre to Centre Long Span = 3 m.

Effective Short Span = 2.885 m.

Effective Long Span = 3.885 m.

**Support Type : Interior Panel  
It is a Two way Slab.**

Initial Thickness of Slab = 125 mm.

**Type of Building is "Mercantile Building"  
Type of Floor is "Retail Shops"**

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>S04 - FLEXURE OUTPUT</b>			
<b>Slab Identification Number</b>	=	<b>S04</b>	
Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.
Long Span to Short Span Ratio	=	1.347	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	42.226	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			
<b><u>Short Span Reinforcement over Centre Portion</u></b>			
Coefficient, alphaX-positive	=	0.037	
Short Span Positive Moment	=	3.765	KN m.
<b>Short Span Positive Steel</b>	=	<b>120</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	418.879	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	654.498	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
<b><u>Short Span Reinforcement over Support Portion</u></b>			

Coefficient, alphaX-negative	=	0.049	
Short Span Negative Moment	=	4.92	KN m.
<b>Short Span Negative Steel</b>	=	<b>140.428</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	357.945	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	559.289	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### **Long Span Reinforcement over Centre Portion**

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	2.416	KN m.
<b>Long Span Positive Steel</b>	=	<b>108</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	465.421	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### **Long Span Reinforcement over Support Portion**

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	3.222	KN m.
<b>Long Span Negative Steel</b>	=	<b>108</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	465.421	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### **Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.375	m.
<b>Area of Steel Required</b>	=	<b>56.25</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### **Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>
Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>
Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.*

#### S04 - SHEAR CHECK

Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	20.94	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	17.45	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	20.94	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	17.45	KN.
<b>Maximum Design Shear</b>	=	<b>20.94</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.209	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.279	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that 0.209 &lt; 0.279 and 0.209 &lt; 2.794.</b>			
<b>The Slab Panel is SAFE in Shear.</b>			

#### S04 - DEFLECTION CHECK

Effective Short Span	=	2.885	m.
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Effective Depth of Slab = 100 mm.  
**Actual Span to Depth Ratio = 28.85**

**As Per IS:456-2000, Clause 24.1,**  
 Factor Alpha = 32

*Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.*

**As Per IS:456-2000, Clause 23.2.1.b,**  
 Factor Zigma = 1

**As Per IS:456-2000, Clause 23.2.1.c,**  
 Factor Gamma = 2

**Allowable Span to Depth Ratio = 64 > 28.85**

**Deflection Requirements are O.K.**

#### S05 - PANEL INPUT

Slab Number = S05

Slab Shape = Rectangular

Centre to Centre Short Span = 4 m.

Centre to Centre Long Span = 5 m.

Effective Short Span = 3.885 m.

Effective Long Span = 4.885 m.

**Support Type : Interior Panel**  
**It is a Two way Slab.**

Initial Thickness of Slab = 125 mm.

**Type of Building is "Mercantile Building"**  
**Type of Floor is "Retail Shops"**

Live Load = 4 KN/sq.m.

Floor Finish Load = 1 KN/sq.m.

Partition Load = NIL

Miscellaneous Load = NIL

#### S05 - FLEXURE OUTPUT

**Slab Identification Number = S05**

Effective Short Span = 3.885 m.

Effective Long Span = 4.885 m.

Long Span to Short Span Ratio = 1.257

**It is a Two way Slab.**

<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>

**Loads on the Slab Panel**

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	54.747	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			

**Short Span Reinforcement over Centre Portion**

Coefficient, alphaX-positive	=	0.034	
Short Span Positive Moment	=	6.262	KN m.
<b>Short Span Positive Steel</b>	=	<b>180.262</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	278.847	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>275</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	435.698	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

**Short Span Reinforcement over Support Portion**

Coefficient, alphaX-negative	=	0.045	
Short Span Negative Moment	=	8.27	KN m.
<b>Short Span Negative Steel</b>	=	<b>241.25</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	208.354	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>200</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	325.553	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

**Long Span Reinforcement over Centre Portion**

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.

<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### **Long Span Reinforcement over Support Portion**

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### **Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### **Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.625	m.
<b>Area of Steel Required</b>	=	<b>93.75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with*

300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided.  
This is done in accordance with IS:456-2000 Clause 26.3.3.

#### S05 - SHEAR CHECK

Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.354	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that 0.282 &lt; 0.354 and 0.282 &lt; 2.794. The Slab Panel is SAFE in Shear.</b>			

#### S05 - DEFLECTION CHECK

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	1.628	
<b>Allowable Span to Depth Ratio</b>	=	<b>52.109</b>	<b>&gt; 38.85</b>

Deflection Requirements are O.K.

#### S06 - PANEL INPUT

Slab Number	=	S06
Slab Shape	=	Rectangular
Centre to Centre Short Span	=	4 m.
Centre to Centre Long Span	=	7 m.
Effective Short Span	=	3.885 m.
Effective Long Span	=	6.885 m.

**Support Type : Interior Panel**  
**It is a Two way Slab.**

Initial Thickness of Slab	=	125 mm.
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**Type of Building is "Mercantile Building"**  
**Type of Floor is "Retail Shops"**

Live Load	=	4 KN/sq.m.
Floor Finish Load	=	1 KN/sq.m.
Partition Load	=	NIL
Miscellaneous Load	=	NIL

#### S06 - FLEXURE OUTPUT

<b>Slab Identification Number</b>	=	<b>S06</b>
Effective Short Span	=	3.885 m.
Effective Long Span	=	6.885 m.
Long Span to Short Span Ratio	=	1.772
<b>It is a Two way Slab.</b>		
<b>Thickness of Slab Provided</b>	=	<b>150 mm.</b>
Concrete Clear Cover	=	20 mm.
Density of Reinforced Concrete	=	24.517 KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065 KN/sq.m.</b>

#### Loads on the Slab Panel

Live Load	=	4 KN/sq.m.
Floor Finish Load	=	1 KN/sq.m.
Partition Load	=	NIL
Miscellaneous Load	=	NIL

<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	63.242	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			
<b><u>Short Span Reinforcement over Centre Portion</u></b>			
Coefficient, alphaX-positive	=	0.045	
Short Span Positive Moment	=	8.281	KN m.
<b>Short Span Positive Steel</b>	=	<b>241.583</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	208.067	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>200</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	325.105	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
<b><u>Short Span Reinforcement over Support Portion</u></b>			
Coefficient, alphaX-negative	=	0.06	
Short Span Negative Moment	=	11.036	KN m.
<b>Short Span Negative Steel</b>	=	<b>328.16</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	153.174	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>150</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	239.334	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>225</b>	<b>mm.</b>
<b><u>Long Span Reinforcement over Centre Portion</u></b>			
Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
<b><u>Long Span Reinforcement over Support Portion</u></b>			
Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

**Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

**Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.875	m.
<b>Area of Steel Required</b>	=	<b>131.25</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.*

**S06 - SHEAR CHECK**

Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.

Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.403	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that 0.282 &lt; 0.403 and 0.282 &lt; 2.794. The Slab Panel is SAFE in Shear.</b>			

#### S06 - DEFLECTION CHECK

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	1.433	
<b>Allowable Span to Depth Ratio</b>	=	<b>45.871</b>	<b>&gt; 38.85</b>
<b>Deflection Requirements are O.K.</b>			

#### S07 - PANEL INPUT

Slab Number	=	S07	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	3	m.
Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.

**Support Type : Interior Panel**  
**It is a Two way Slab.**

Initial Thickness of Slab = 125 mm.

**Type of Building is "Mercantile Building"**  
**Type of Floor is "Retail Shops"**

Live Load = 4 KN/sq.m.

Floor Finish Load = 1 KN/sq.m.

Partition Load = NIL

Miscellaneous Load = NIL

### S07 - FLEXURE OUTPUT

**Slab Identification Number = S07**

Effective Short Span = 2.885 m.

Effective Long Span = 3.885 m.

Long Span to Short Span Ratio = 1.347

**It is a Two way Slab.**

**Thickness of Slab Provided = 150 mm.**

Concrete Clear Cover = 20 mm.

Density of Reinforced Concrete = 24.517 KN/cu.m.

**Dead Weight of Slab = 3.065 KN/sq.m.**

#### Loads on the Slab Panel

Live Load = 4 KN/sq.m.

Floor Finish Load = 1 KN/sq.m.

Partition Load = NIL

Miscellaneous Load = NIL

**Total Load on Slab Panel = 8.065 KN/sq.m.**

Safety Factor for Load = 1.5

**Total Factored Load on Slab Panel = 12.097 KN/sq.m.**

Effective Depth Required = 42.226 mm.

Effective Depth Provided = 100 mm.

**Hence SAFE.**

#### Short Span Reinforcement over Centre Portion

Coefficient, alphaX-positive = 0.037

Short Span Positive Moment = 3.765 KN m.

**Short Span Positive Steel = 120 sq.mm.**

Dia. of Rod-1 along Short Span = 8 mm.

Required Spacing along Short Span (+)	=	418.879	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	654.498	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Short Span Reinforcement over Support Portion

Coefficient, alphaX-negative	=	0.049	
Short Span Negative Moment	=	4.92	KN m.
<b>Short Span Negative Steel</b>	=	<b>140.428</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	357.945	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	559.289	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	2.416	KN m.
<b>Long Span Positive Steel</b>	=	<b>108</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	465.421	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Support Portion

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	3.222	KN m.
<b>Long Span Negative Steel</b>	=	<b>108</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	465.421	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Edge Strip Reinforcement along Short Span

Width of Edge Strip for Short Span	=	0.375	m.
<b>Area of Steel Required</b>	=	<b>56.25</b>	<b>sq.mm.</b>
Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

**Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.*

**S07 - SHEAR CHECK**

Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	20.94	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	17.45	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	20.94	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	17.45	KN.
<b>Maximum Design Shear</b>	=	<b>20.94</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.209	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.279	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b>			

Max. Permissible Shear Stress = 2.794 N/sq.mm.

**It can be seen that  $0.209 < 0.279$  and  $0.209 < 2.794$ .  
The Slab Panel is SAFE in Shear.**

#### S07 - DEFLECTION CHECK

Effective Short Span = 2.885 m.

Effective Depth of Slab = 100 mm.

**Actual Span to Depth Ratio = 28.85**

**As Per IS:456-2000, Clause 24.1,**

Factor Alpha = 32

*Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.*

**As Per IS:456-2000, Clause 23.2.1.b,**

Factor Zigma = 1

**As Per IS:456-2000, Clause 23.2.1.c,**

Factor Gamma = 2

**Allowable Span to Depth Ratio = 64 > 28.85**

**Deflection Requirements are O.K.**

#### S08 - PANEL INPUT

Slab Number = S08

Slab Shape = Rectangular

Centre to Centre Short Span = 4 m.

Centre to Centre Long Span = 5 m.

Effective Short Span = 3.885 m.

Effective Long Span = 4.885 m.

**Support Type : Interior Panel**

**It is a Two way Slab.**

Initial Thickness of Slab = 125 mm.

**Type of Building is "Mercantile Building"**

**Type of Floor is "Retail Shops"**

Live Load = 4 KN/sq.m.

Floor Finish Load = 1 KN/sq.m.

Partition Load = NIL

Miscellaneous Load = NIL

## S08 - FLEXURE OUTPUT

<b>Slab Identification Number</b>	=	<b>S08</b>	
Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
Long Span to Short Span Ratio	=	1.257	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	54.747	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			
<b><u>Short Span Reinforcement over Centre Portion</u></b>			
Coefficient, alphaX-positive	=	0.034	
Short Span Positive Moment	=	6.262	KN m.
<b>Short Span Positive Steel</b>	=	<b>180.262</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	278.847	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>275</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	435.698	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
<b><u>Short Span Reinforcement over Support Portion</u></b>			
Coefficient, alphaX-negative	=	0.045	
Short Span Negative Moment	=	8.27	KN m.
<b>Short Span Negative Steel</b>	=	<b>241.25</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	208.354	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>200</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	325.553	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Support Portion

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Edge Strip Reinforcement along Short Span

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### Edge Strip Reinforcement along Long Span

Width of Edge Strip for Long Span	=	0.625	m.
<b>Area of Steel Required</b>	=	<b>93.75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.

Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.

#### S08 - SHEAR CHECK

Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.354	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that 0.282 &lt; 0.354 and 0.282 &lt; 2.794.</b>			
<b>The Slab Panel is SAFE in Shear.</b>			

#### S08 - DEFLECTION CHECK

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	

Though the Code stipulates the above value for spans upto 3.5 m., it's a

common practice to use the above value even for larger spans.

**As Per IS:456-2000, Clause 23.2.1.b,**

Factor Zigma = 1

**As Per IS:456-2000, Clause 23.2.1.c,**

Factor Gamma = 1.628

**Allowable Span to Depth Ratio = 52.109 > 38.85**

**Deflection Requirements are O.K.**

#### S09 - PANEL INPUT

Slab Number = S09

Slab Shape = Rectangular

Centre to Centre Short Span = 4 m.

Centre to Centre Long Span = 7 m.

Effective Short Span = 3.885 m.

Effective Long Span = 6.885 m.

**Support Type : Interior Panel  
It is a Two way Slab.**

Initial Thickness of Slab = 125 mm.

**Type of Building is "Mercantile Building"  
Type of Floor is "Retail Shops"**

Live Load = 4 KN/sq.m.

Floor Finish Load = 1 KN/sq.m.

Partition Load = NIL

Miscellaneous Load = NIL

#### S09 - FLEXURE OUTPUT

**Slab Identification Number = S09**

Effective Short Span = 3.885 m.

Effective Long Span = 6.885 m.

Long Span to Short Span Ratio = 1.772

**It is a Two way Slab.**

**Thickness of Slab Provided = 150 mm.**

Concrete Clear Cover = 20 mm.

Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>

#### Loads on the Slab Panel

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	

<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
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Effective Depth Required	=	63.242	mm.
Effective Depth Provided	=	100	mm.

Hence **SAFE**.

#### Short Span Reinforcement over Centre Portion

Coefficient, alphaX-positive	=	0.045	
Short Span Positive Moment	=	8.281	KN m.
<b>Short Span Positive Steel</b>	=	<b>241.583</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	208.067	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>200</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	325.105	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Short Span Reinforcement over Support Portion

Coefficient, alphaX-negative	=	0.06	
Short Span Negative Moment	=	11.036	KN m.
<b>Short Span Negative Steel</b>	=	<b>328.16</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	153.174	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>150</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	239.334	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>225</b>	<b>mm.</b>

#### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### **Long Span Reinforcement over Support Portion**

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### **Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### **Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.875	m.
<b>Area of Steel Required</b>	=	<b>131.25</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.*

### **S09 - SHEAR CHECK**

Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.403	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that <math>0.282 &lt; 0.403</math> and <math>0.282 &lt; 2.794</math>. The Slab Panel is SAFE in Shear.</b>			

#### S09 - DEFLECTION CHECK

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	1.433	
<b>Allowable Span to Depth Ratio</b>	=	<b>45.871</b>	<b>&gt; 38.85</b>
<b>Deflection Requirements are O.K.</b>			

#### S10 - PANEL INPUT

Slab Number	=	S10	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	3	m.
Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.

**Support Type : Interior Panel**  
**It is a Two way Slab.**

Initial Thickness of Slab	=	125	mm.
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**Type of Building is "Mercantile Building"**  
**Type of Floor is "Retail Shops"**

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

#### S10 - FLEXURE OUTPUT

<b>Slab Identification Number</b>	=	<b>S10</b>	
Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.
Long Span to Short Span Ratio	=	1.347	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	42.226	mm.

Effective Depth Provided = 100 mm.  
Hence **SAFE**.

**Short Span Reinforcement over Centre Portion**

Coefficient, alphaX-positive = 0.037  
Short Span Positive Moment = 3.765 KN m.  
**Short Span Positive Steel** = **120 sq.mm.**

Dia. of Rod-1 along Short Span = 8 mm.  
Required Spacing along Short Span (+) = 418.879 mm.  
**Max. Spacing allowed (Rounded off) (+)** = **300 mm.**

Dia. of Rod-2 along Short Span = 10 mm.  
Required Spacing along Short Span (+) = 654.498 mm.  
**Max. Spacing allowed (Rounded off) (+)** = **300 mm.**

**Short Span Reinforcement over Support Portion**

Coefficient, alphaX-negative = 0.049  
Short Span Negative Moment = 4.92 KN m.  
**Short Span Negative Steel** = **140.428 sq.mm.**

Dia. of Rod-1 along Short Span = 8 mm.  
Required Spacing along Short Span (-) = 357.945 mm.  
**Max. Spacing allowed (Rounded off) (-)** = **300 mm.**

Dia. of Rod-2 along Short Span = 10 mm.  
Required Spacing along Short Span (-) = 559.289 mm.  
**Max. Spacing allowed (Rounded off) (-)** = **300 mm.**

**Long Span Reinforcement over Centre Portion**

Coefficient, alphaY-positive = 0.024  
Long Span Positive Moment = 2.416 KN m.  
**Long Span Positive Steel** = **108 sq.mm.**

Dia of Rod-1 along Long Span = 8 mm.  
Required Spacing along Long Span (+) = 465.421 mm.  
**Max. Spacing allowed (Rounded off) (+)** = **300 mm.**

Dia of Rod-2 along Long Span = 10 mm.  
Required Spacing along Long Span (+) = 727.221 mm.  
**Max. Spacing allowed (Rounded off) (+)** = **300 mm.**

**Long Span Reinforcement over Support Portion**

Coefficient, alphaY-negative = 0.032  
Long Span Negative Moment = 3.222 KN m.  
**Long Span Negative Steel** = **108 sq.mm.**

Dia of Rod-1 along Long Span = 8 mm.  
Required Spacing along Long Span (-) = 465.421 mm.  
**Max. Spacing allowed (Rounded off) (-)** = **300 mm.**

Dia of Rod-2 along Long Span = 10 mm.  
Required Spacing along Long Span (-) = 727.221 mm.

**Max. Spacing allowed (Rounded off) (-) = 300 mm.**

**Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span = 0.375 m.  
**Area of Steel Required = 56.25 sq.mm.**

Dia. of Edge Steel Rod-0 = 8 mm.  
 Required Spacing of Rod-0 = 335.103 mm.  
**Max. Spacing allowed (Rounded off) = 325 mm.**

Dia. of Edge Steel Rod-1 = 10 mm.  
 Required Spacing of Rod-1 = 523.599 mm.  
**Max. Spacing allowed (Rounded off) = 450 mm.**

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

**Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span = 0.5 m.  
**Area of Steel Required = 75 sq.mm.**

Dia. of Edge Steel Rod-0 = 8 mm.  
 Required Spacing of Rod-0 = 335.103 mm.  
**Max. Spacing allowed (Rounded off) = 325 mm.**

Dia. of Edge Steel Rod-1 = 10 mm.  
 Required Spacing of Rod-1 = 523.599 mm.  
**Max. Spacing allowed (Rounded off) = 450 mm.**

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.*

**S10 - SHEAR CHECK**

Effective Short Span = 2.885 m.  
 Effective Long Span = 3.885 m.  
**Total Factored Load per Unit Length = 12.097 KN/m.**

Shear Coeff. for Continuous Edge-X = 0.6  
 Corresponding Design Shear = 20.94 KN.

Shear Coeff. for Discontinuous Edge-X = 0.5  
 Corresponding Design Shear = 17.45 KN.

Shear Coeff. for Continuous Edge-Y = 0.6  
 Corresponding Design Shear = 20.94 KN.

Shear Coeff. for Discontinuous Edge-Y = 0.5  
 Corresponding Design Shear = 17.45 KN.

<b>Maximum Design Shear</b>	=	<b>20.94</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.209	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.279	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.

**It can be seen that  $0.209 < 0.279$  and  $0.209 < 2.794$ .  
The Slab Panel is SAFE in Shear.**

#### S10 - DEFLECTION CHECK

Effective Short Span	=	2.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>28.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	2	
<b>Allowable Span to Depth Ratio</b>	=	<b>64</b>	<b>&gt; 28.85</b>

**Deflection Requirements are O.K.**

#### S11 - PANEL INPUT

Slab Number	=	S11	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	5	m.
Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
<b>Support Type : Interior Panel</b> <b>It is a Two way Slab.</b>			
Initial Thickness of Slab	=	125	mm.

**Type of Building is "Mercantile Building"**

**Type of Floor is "Retail Shops"**

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

#### **S11 - FLEXURE OUTPUT**

<b>Slab Identification Number</b>	=	<b>S11</b>	
Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
Long Span to Short Span Ratio	=	1.257	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	54.747	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			
<b><u>Short Span Reinforcement over Centre Portion</u></b>			
Coefficient, alphaX-positive	=	0.034	
Short Span Positive Moment	=	6.262	KN m.
<b>Short Span Positive Steel</b>	=	<b>180.262</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	278.847	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>275</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	435.698	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

### Short Span Reinforcement over Support Portion

Coefficient, alphaX-negative	=	0.045	
Short Span Negative Moment	=	8.27	KN m.
<b>Short Span Negative Steel</b>	=	<b>241.25</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	208.354	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>200</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	325.553	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

### Long Span Reinforcement over Support Portion

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

### Edge Strip Reinforcement along Short Span

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>
Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>
Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span*

across the specified Width.

**Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.625	m.
<b>Area of Steel Required</b>	=	<b>93.75</b>	<b>sq.mm.</b>
Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>
Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.

Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.

**S11 - SHEAR CHECK**

Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.354	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.

**It can be seen that 0.282 < 0.354 and 0.282 < 2.794.  
The Slab Panel is SAFE in Shear.**

**S11 - DEFLECTION CHECK**

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b>			
Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b>			
Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b>			
Factor Gamma	=	1.628	
<b>Allowable Span to Depth Ratio</b>	=	<b>52.109</b>	<b>&gt; 38.85</b>
<b>Deflection Requirements are O.K.</b>			

#### S12 - PANEL INPUT

Slab Number	=	S12	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	7	m.
Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
<b>Support Type : Interior Panel</b>			
<b>It is a Two way Slab.</b>			
Initial Thickness of Slab	=	125	mm.
<b>Type of Building is "Mercantile Building"</b>			
<b>Type of Floor is "Retail Shops"</b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

#### S12 - FLEXURE OUTPUT

<b>Slab Identification Number</b>	=	<b>S12</b>	
Effective Short Span	=	3.885	m.

Effective Long Span	=	6.885	m.
Long Span to Short Span Ratio	=	1.772	

**It is a Two way Slab.**

<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>

**Loads on the Slab Panel**

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	

**Total Factored Load on Slab Panel = 12.097 KN/sq.m.**

Effective Depth Required	=	63.242	mm.
Effective Depth Provided	=	100	mm.

**Hence SAFE.**

**Short Span Reinforcement over Centre Portion**

Coefficient, alphaX-positive	=	0.045	
Short Span Positive Moment	=	8.281	KN m.
<b>Short Span Positive Steel</b>	=	<b>241.583</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	208.067	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>200</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	325.105	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

**Short Span Reinforcement over Support Portion**

Coefficient, alphaX-negative	=	0.06	
Short Span Negative Moment	=	11.036	KN m.
<b>Short Span Negative Steel</b>	=	<b>328.16</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	153.174	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>150</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	239.334	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>225</b>	<b>mm.</b>

**Long Span Reinforcement over Centre Portion**

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### **Long Span Reinforcement over Support Portion**

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### **Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### **Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.875	m.
<b>Area of Steel Required</b>	=	<b>131.25</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span*

across the specified Width.

Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided.

This is done in accordance with IS:456-2000 Clause 26.3.3.

### S12 - SHEAR CHECK

Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.403	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that <math>0.282 &lt; 0.403</math> and <math>0.282 &lt; 2.794</math>. The Slab Panel is SAFE in Shear.</b>			

### S12 - DEFLECTION CHECK

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b>			

Factor Gamma	=	1.433	
<b>Allowable Span to Depth Ratio</b>	=	<b>45.871</b>	<b>&gt; 38.85</b>
<b>Deflection Requirements are O.K.</b>			

### S13 - PANEL INPUT

Slab Number	=	S13	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	3	m.
Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.
<b>Support Type : Interior Panel</b>			
<b>It is a Two way Slab.</b>			
Initial Thickness of Slab	=	125	mm.
<b>Type of Building is "Mercantile Building"</b>			
<b>Type of Floor is "Retail Shops"</b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

### S13 - FLEXURE OUTPUT

<b>Slab Identification Number</b>	=	<b>S13</b>	
Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.
Long Span to Short Span Ratio	=	1.347	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.

Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	42.226	mm.
Effective Depth Provided	=	100	mm.

**Hence SAFE.**

#### Short Span Reinforcement over Centre Portion

Coefficient, alphaX-positive	=	0.037	
Short Span Positive Moment	=	3.765	KN m.
<b>Short Span Positive Steel</b>	=	<b>120</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	418.879	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	654.498	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Short Span Reinforcement over Support Portion

Coefficient, alphaX-negative	=	0.049	
Short Span Negative Moment	=	4.92	KN m.
<b>Short Span Negative Steel</b>	=	<b>140.428</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	357.945	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	559.289	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	2.416	KN m.
<b>Long Span Positive Steel</b>	=	<b>108</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	465.421	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Support Portion

Coefficient, alphaY-negative	=	0.032	
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Long Span Negative Moment	=	3.222	KN m.
<b>Long Span Negative Steel</b>	=	<b>108</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	465.421	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

**Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.375	m.
<b>Area of Steel Required</b>	=	<b>56.25</b>	<b>sq.mm.</b>
Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>
Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

**Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>
Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>
Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.*

**S13 - SHEAR CHECK**

Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	20.94	KN.

Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	17.45	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	20.94	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	17.45	KN.
<b>Maximum Design Shear</b>	=	<b>20.94</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.209	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.279	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that <math>0.209 &lt; 0.279</math> and <math>0.209 &lt; 2.794</math>. The Slab Panel is SAFE in Shear.</b>			

#### S13 - DEFLECTION CHECK

Effective Short Span	=	2.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>28.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	2	
<b>Allowable Span to Depth Ratio</b>	=	<b>64</b>	<b>&gt; 28.85</b>
<b>Deflection Requirements are O.K.</b>			

#### S14 - PANEL INPUT

Slab Number	=	S14	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	5	m.

Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.

**Support Type : Interior Panel**  
**It is a Two way Slab.**

Initial Thickness of Slab	=	125	mm.
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**Type of Building is "Mercantile Building"**  
**Type of Floor is "Retail Shops"**

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

#### S14 - FLEXURE OUTPUT

<b>Slab Identification Number</b>	=	<b>S14</b>	
Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
Long Span to Short Span Ratio	=	1.257	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	54.747	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			
<b><u>Short Span Reinforcement over Centre Portion</u></b>			
Coefficient, alphaX-positive	=	0.034	
Short Span Positive Moment	=	6.262	KN m.

<b>Short Span Positive Steel</b>	=	<b>180.262</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	278.847	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>275</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	435.698	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### **Short Span Reinforcement over Support Portion**

Coefficient, alphaX-negative	=	0.045	
Short Span Negative Moment	=	8.27	KN m.
<b>Short Span Negative Steel</b>	=	<b>241.25</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	208.354	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>200</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	325.553	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### **Long Span Reinforcement over Centre Portion**

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### **Long Span Reinforcement over Support Portion**

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### **Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### **Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.625	m.
<b>Area of Steel Required</b>	=	<b>93.75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.*

#### **S14 - SHEAR CHECK**

Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b>			

Design Shear Strength of Concrete	=	0.354	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that <math>0.282 &lt; 0.354</math> and <math>0.282 &lt; 2.794</math>. The Slab Panel is SAFE in Shear.</b>			
S14 - DEFLECTION CHECK			
Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	1.628	
<b>Allowable Span to Depth Ratio</b>	=	<b>52.109</b>	<b>&gt; 38.85</b>
<b>Deflection Requirements are O.K.</b>			

S15 - PANEL INPUT			
Slab Number	=	S15	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	7	m.
Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
<b>Support Type : Interior Panel It is a Two way Slab.</b>			
Initial Thickness of Slab	=	125	mm.
<b>Type of Building is "Mercantile Building" Type of Floor is "Retail Shops"</b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.

Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>S15 - FLEXURE OUTPUT</b>			
<b>Slab Identification Number</b>	=	<b>S15</b>	
Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
Long Span to Short Span Ratio	=	1.772	
<b>It is a Two way Slab.</b>			
<b>Thickness of Slab Provided</b>	=	<b>150</b>	<b>mm.</b>
Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>			
Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	
<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	
<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	63.242	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			
<b><u>Short Span Reinforcement over Centre Portion</u></b>			
Coefficient, alphaX-positive	=	0.045	
Short Span Positive Moment	=	8.281	KN m.
<b>Short Span Positive Steel</b>	=	<b>241.583</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	208.067	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>200</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	325.105	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
<b><u>Short Span Reinforcement over Support Portion</u></b>			
Coefficient, alphaX-negative	=	0.06	
Short Span Negative Moment	=	11.036	KN m.
<b>Short Span Negative Steel</b>	=	<b>328.16</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	153.174	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>150</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	239.334	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>225</b>	<b>mm.</b>

#### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Support Portion

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Edge Strip Reinforcement along Short Span

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### Edge Strip Reinforcement along Long Span

Width of Edge Strip for Long Span	=	0.875	m.
<b>Area of Steel Required</b>	=	<b>131.25</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.*

#### S15 - SHEAR CHECK

Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.403	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that 0.282 &lt; 0.403 and 0.282 &lt; 2.794.</b>			
<b>The Slab Panel is SAFE in Shear.</b>			

#### S15 - DEFLECTION CHECK

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b>			

Factor Alpha = 32

*Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.*

**As Per IS:456-2000, Clause 23.2.1.b,**

Factor Zigma = 1

**As Per IS:456-2000, Clause 23.2.1.c,**

Factor Gamma = 1.433

**Allowable Span to Depth Ratio = 45.871 > 38.85**

**Deflection Requirements are O.K.**

#### S16 - PANEL INPUT

Slab Number = S16

Slab Shape = Rectangular

Centre to Centre Short Span = 4 m.

Centre to Centre Long Span = 3 m.

Effective Short Span = 2.885 m.

Effective Long Span = 3.885 m.

**Support Type : Interior Panel**

**It is a Two way Slab.**

Initial Thickness of Slab = 125 mm.

**Type of Building is "Mercantile Building"**

**Type of Floor is "Retail Shops"**

Live Load = 4 KN/sq.m.

Floor Finish Load = 1 KN/sq.m.

Partition Load = NIL

Miscellaneous Load = NIL

#### S16 - FLEXURE OUTPUT

**Slab Identification Number = S16**

Effective Short Span = 2.885 m.

Effective Long Span = 3.885 m.

Long Span to Short Span Ratio = 1.347

**It is a Two way Slab.**

**Thickness of Slab Provided = 150 mm.**

Concrete Clear Cover	=	20	mm.
Density of Reinforced Concrete	=	24.517	KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065</b>	<b>KN/sq.m.</b>

#### Loads on the Slab Panel

Live Load	=	4	KN/sq.m.
Floor Finish Load	=	1	KN/sq.m.
Partition Load	=	NIL	
Miscellaneous Load	=	NIL	

<b>Total Load on Slab Panel</b>	=	<b>8.065</b>	<b>KN/sq.m.</b>
Safety Factor for Load	=	1.5	

<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
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Effective Depth Required	=	42.226	mm.
Effective Depth Provided	=	100	mm.

**Hence SAFE.**

#### Short Span Reinforcement over Centre Portion

Coefficient, alphaX-positive	=	0.037	
Short Span Positive Moment	=	3.765	KN m.
<b>Short Span Positive Steel</b>	=	<b>120</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	418.879	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	654.498	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Short Span Reinforcement over Support Portion

Coefficient, alphaX-negative	=	0.049	
Short Span Negative Moment	=	4.92	KN m.
<b>Short Span Negative Steel</b>	=	<b>140.428</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	357.945	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	559.289	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	2.416	KN m.
<b>Long Span Positive Steel</b>	=	<b>108</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	465.421	mm.

<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### **Long Span Reinforcement over Support Portion**

Coefficient, $\alpha_Y$ -negative	=	0.032	
Long Span Negative Moment	=	3.222	KN m.
<b>Long Span Negative Steel</b>	=	<b>108</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	465.421	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	727.221	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### **Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.375	m.
<b>Area of Steel Required</b>	=	<b>56.25</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### **Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided.  
This is done in accordance with IS:456-2000 Clause 26.3.3.*

**S16 - SHEAR CHECK**

Effective Short Span	=	2.885	m.
Effective Long Span	=	3.885	m.
<b>Total Factored Load per Unit Length</b>	<b>=</b>	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	20.94	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	17.45	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	20.94	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	17.45	KN.
<b>Maximum Design Shear</b>	<b>=</b>	<b>20.94</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.209	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.279	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that 0.209 &lt; 0.279 and 0.209 &lt; 2.794.</b>			
<b>The Slab Panel is SAFE in Shear.</b>			

**S16 - DEFLECTION CHECK**

Effective Short Span	=	2.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	<b>=</b>	<b>28.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	2	
<b>Allowable Span to Depth Ratio</b>	<b>=</b>	<b>64</b>	<b>&gt; 28.85</b>
<b>Deflection Requirements are O.K.</b>			

**S17 - PANEL INPUT**

Slab Number	=	S17
Slab Shape	=	Rectangular
Centre to Centre Short Span	=	4 m.
Centre to Centre Long Span	=	5 m.
Effective Short Span	=	3.885 m.
Effective Long Span	=	4.885 m.

**Support Type : Interior Panel**  
**It is a Two way Slab.**

Initial Thickness of Slab = 125 mm.

**Type of Building is "Mercantile Building"**  
**Type of Floor is "Retail Shops"**

Live Load	=	4 KN/sq.m.
Floor Finish Load	=	1 KN/sq.m.
Partition Load	=	NIL
Miscellaneous Load	=	NIL

**S17 - FLEXURE OUTPUT**

<b>Slab Identification Number</b>	=	<b>S17</b>
Effective Short Span	=	3.885 m.
Effective Long Span	=	4.885 m.
Long Span to Short Span Ratio	=	1.257
<b>It is a Two way Slab.</b>		
<b>Thickness of Slab Provided</b>	=	<b>150 mm.</b>
Concrete Clear Cover	=	20 mm.
Density of Reinforced Concrete	=	24.517 KN/cu.m.
<b>Dead Weight of Slab</b>	=	<b>3.065 KN/sq.m.</b>
<b><u>Loads on the Slab Panel</u></b>		
Live Load	=	4 KN/sq.m.
Floor Finish Load	=	1 KN/sq.m.
Partition Load	=	NIL
Miscellaneous Load	=	NIL
<b>Total Load on Slab Panel</b>	=	<b>8.065 KN/sq.m.</b>
Safety Factor for Load	=	1.5

<b>Total Factored Load on Slab Panel</b>	=	<b>12.097</b>	<b>KN/sq.m.</b>
Effective Depth Required	=	54.747	mm.
Effective Depth Provided	=	100	mm.
<b>Hence SAFE.</b>			

#### Short Span Reinforcement over Centre Portion

Coefficient, alphaX-positive	=	0.034	
Short Span Positive Moment	=	6.262	KN m.
<b>Short Span Positive Steel</b>	=	<b>180.262</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (+)	=	278.847	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>275</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	435.698	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Short Span Reinforcement over Support Portion

Coefficient, alphaX-negative	=	0.045	
Short Span Negative Moment	=	8.27	KN m.
<b>Short Span Negative Steel</b>	=	<b>241.25</b>	<b>sq.mm.</b>
Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	208.354	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>200</b>	<b>mm.</b>
Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	325.553	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Centre Portion

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### Long Span Reinforcement over Support Portion

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>
Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.

<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>
Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

**Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

**Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.625	m.
<b>Area of Steel Required</b>	=	<b>93.75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided. This is done in accordance with IS:456-2000 Clause 26.3.3.*

**S17 - SHEAR CHECK**

Effective Short Span	=	3.885	m.
Effective Long Span	=	4.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	

Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.354	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.
<b>It can be seen that 0.282 &lt; 0.354 and 0.282 &lt; 2.794. The Slab Panel is SAFE in Shear.</b>			

#### S17 - DEFLECTION CHECK

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	
<b>As Per IS:456-2000, Clause 24.1,</b> Factor Alpha	=	32	
<i>Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.</i>			
<b>As Per IS:456-2000, Clause 23.2.1.b,</b> Factor Zigma	=	1	
<b>As Per IS:456-2000, Clause 23.2.1.c,</b> Factor Gamma	=	1.628	
<b>Allowable Span to Depth Ratio</b>	=	<b>52.109</b>	<b>&gt; 38.85</b>
<b>Deflection Requirements are O.K.</b>			

#### S18 - PANEL INPUT

Slab Number	=	S18	
Slab Shape	=	Rectangular	
Centre to Centre Short Span	=	4	m.
Centre to Centre Long Span	=	7	m.
Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
<b>Support Type : Interior Panel</b>			

**It is a Two way Slab.**

Initial Thickness of Slab = 125 mm.

**Type of Building is "Mercantile Building"**

**Type of Floor is "Retail Shops"**

Live Load = 4 KN/sq.m.

Floor Finish Load = 1 KN/sq.m.

Partition Load = NIL

Miscellaneous Load = NIL

### S18 - FLEXURE OUTPUT

**Slab Identification Number = S18**

Effective Short Span = 3.885 m.

Effective Long Span = 6.885 m.

Long Span to Short Span Ratio = 1.772

**It is a Two way Slab.**

**Thickness of Slab Provided = 150 mm.**

Concrete Clear Cover = 20 mm.

Density of Reinforced Concrete = 24.517 KN/cu.m.

**Dead Weight of Slab = 3.065 KN/sq.m.**

#### Loads on the Slab Panel

Live Load = 4 KN/sq.m.

Floor Finish Load = 1 KN/sq.m.

Partition Load = NIL

Miscellaneous Load = NIL

**Total Load on Slab Panel = 8.065 KN/sq.m.**

Safety Factor for Load = 1.5

**Total Factored Load on Slab Panel = 12.097 KN/sq.m.**

Effective Depth Required = 63.242 mm.

Effective Depth Provided = 100 mm.

**Hence SAFE.**

#### Short Span Reinforcement over Centre Portion

Coefficient, alphaX-positive = 0.045

Short Span Positive Moment = 8.281 KN m.

**Short Span Positive Steel = 241.583 sq.mm.**

Dia. of Rod-1 along Short Span = 8 mm.

Required Spacing along Short Span (+) = 208.067 mm.

**Max. Spacing allowed (Rounded off) (+) = 200 mm.**

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (+)	=	325.105	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### **Short Span Reinforcement over Support Portion**

Coefficient, alphaX-negative	=	0.06	
Short Span Negative Moment	=	11.036	KN m.
<b>Short Span Negative Steel</b>	=	<b>328.16</b>	<b>sq.mm.</b>

Dia. of Rod-1 along Short Span	=	8	mm.
Required Spacing along Short Span (-)	=	153.174	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>150</b>	<b>mm.</b>

Dia. of Rod-2 along Short Span	=	10	mm.
Required Spacing along Short Span (-)	=	239.334	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>225</b>	<b>mm.</b>

#### **Long Span Reinforcement over Centre Portion**

Coefficient, alphaY-positive	=	0.024	
Long Span Positive Moment	=	4.382	KN m.
<b>Long Span Positive Steel</b>	=	<b>139.399</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (+)	=	360.586	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (+)	=	563.416	mm.
<b>Max. Spacing allowed (Rounded off) (+)</b>	=	<b>300</b>	<b>mm.</b>

#### **Long Span Reinforcement over Support Portion**

Coefficient, alphaY-negative	=	0.032	
Long Span Negative Moment	=	5.843	KN m.
<b>Long Span Negative Steel</b>	=	<b>188.045</b>	<b>sq.mm.</b>

Dia of Rod-1 along Long Span	=	8	mm.
Required Spacing along Long Span (-)	=	267.306	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>250</b>	<b>mm.</b>

Dia of Rod-2 along Long Span	=	10	mm.
Required Spacing along Long Span (-)	=	417.666	mm.
<b>Max. Spacing allowed (Rounded off) (-)</b>	=	<b>300</b>	<b>mm.</b>

#### **Edge Strip Reinforcement along Short Span**

Width of Edge Strip for Short Span	=	0.5	m.
<b>Area of Steel Required</b>	=	<b>75</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
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Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Longer Span across the specified Width.*

#### **Edge Strip Reinforcement along Long Span**

Width of Edge Strip for Long Span	=	0.875	m.
<b>Area of Steel Required</b>	=	<b>131.25</b>	<b>sq.mm.</b>

Dia. of Edge Steel Rod-0	=	8	mm.
Required Spacing of Rod-0	=	335.103	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>325</b>	<b>mm.</b>

Dia. of Edge Steel Rod-1	=	10	mm.
Required Spacing of Rod-1	=	523.599	mm.
<b>Max. Spacing allowed (Rounded off)</b>	=	<b>450</b>	<b>mm.</b>

*Provide the above Reinforcement on both Edges along the Shorter Span across the specified Width.*

*Note:- The required Spacing of Main Rods will be compared with 300 mm. (11.811") or 3d whichever is less. If the required spacing exceeds this limit, the least value will be automatically provided.  
This is done in accordance with IS:456-2000 Clause 26.3.3.*

#### **S18 - SHEAR CHECK**

Effective Short Span	=	3.885	m.
Effective Long Span	=	6.885	m.
<b>Total Factored Load per Unit Length</b>	=	<b>12.097</b>	<b>KN/m.</b>
Shear Coeff. for Continuous Edge-X	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-X	=	0.5	
Corresponding Design Shear	=	23.498	KN.
Shear Coeff. for Continuous Edge-Y	=	0.6	
Corresponding Design Shear	=	28.198	KN.
Shear Coeff. for Discontinuous Edge-Y	=	0.5	
Corresponding Design Shear	=	23.498	KN.
<b>Maximum Design Shear</b>	=	<b>28.198</b>	<b>KN.</b>
<b>As Per IS:456-2000, Clause 40.1,</b> Actual Shear Stress	=	0.282	N/sq.mm.
<b>As Per IS:456-2000, Table 19,</b> Design Shear Strength of Concrete	=	0.403	N/sq.mm.
<b>As Per IS:456-2000, Table 20,</b> Max. Permissible Shear Stress	=	2.794	N/sq.mm.

It can be seen that  $0.282 < 0.403$  and  $0.282 < 2.794$ .  
The Slab Panel is SAFE in Shear.

#### S18 - DEFLECTION CHECK

Effective Short Span	=	3.885	m.
Effective Depth of Slab	=	100	mm.
<b>Actual Span to Depth Ratio</b>	=	<b>38.85</b>	

**As Per IS:456-2000, Clause 24.1,**  
Factor Alpha

= 32

*Though the Code stipulates the above value for spans upto 3.5 m., it's a common practice to use the above value even for larger spans.*

**As Per IS:456-2000, Clause 23.2.1.b,**  
Factor Zigma

= 1

**As Per IS:456-2000, Clause 23.2.1.c,**  
Factor Gamma

= 1.433

**Allowable Span to Depth Ratio** = **45.871 > 38.85**

**Deflection Requirements are O.K.**