Opening Reinforcement

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There are 3 types of reinforcement available for openings: Edge Rebar, Opening Diagonal Rebar, and Opening U/O stirrups.



Also note:



Opening Edge Rebar



Opening Reinforcement : AGACAD



Opening Edge Rebar refers to straight bars around openings, which may be either vertical (side faces of opening) or horizontal (top/bottom faces of opening). The maximum number of bars on one edge is 4. At the bottom of the configuration window you can see a schematic layout of bars. Each row is represented by a different offset from the opening edge, but the actual distance is controlled by the Edge Cover parameter, so they might be in the same line.

First of all, select vertical or horizontal depending on the reinforcement that you want to define:



You can define settings for selected reinforcement in this kind of format:

ſ	- Left Edge Bar Configuration								
	New Item Remove Item Move Up Move Down								
		Count	Rebar Type	Anchorage Length	Position	Edge Cover	Interior Cover	Exterior Cover	End Cover
	1	2 🔺	H12 ×	600 mm	External and Internal	25 mm	40 mm	40 mm	25 mm
	2	1 🔦	H12 ~	600 mm	Center v	25 mm			25 mm

New Item – adds an additional line of reinforcement. A maximum of 2 lines are allowed.

Remove – removes reinforcement definition line.

Move Up/down – moves them in defined direction.

Count - defines how many bars you want to create in one row (max 2).

Rebar Type – choose rebar type.

Anchorage Length – defines the length of rebar that should extend from opening edge. If there will be another wall edge within achnorage distance - bar will be bended along that edge.

Position – two options:

Center – places rebar in the center of the wall.

External and Internal – places rebar with defined covers from external/internal sides of the wall layer.

Edge Cover – cover from opening edge.

Interior/Exterior cover - covers from external/internal sides of the wall layer.

End cover - if extended bar will meet another edge of the wall, then it will use this setting as a cover from that edge.



There is an option to use a different layout of rebar on Left/Right or Top/Bottom rebar. If you switch it on, you will be able to define different rebar for the other side.

ening Edg	ge Rebar Opening Diagonal Rebar O	Opening U/O-St	tirrups				
rtical Ho	orizontal						
 Left Edge 	e Bar Configuration						
New Item	Remove Item Move Up Move	e Down					
Cour	nt Rebar Type	Anchorage Length	Position	Edge Cover	Interior Cover	Exterior Cover	End Cover
1 2	➡ H12	600 mm	External and Internal	25 mm	40 mm	40 mm	25 mm
New Item	Remove Item Move Up Move	e Down Anchorage	Position	Edge	Interior	Exterior	End
Cour	nt Rebar Type	Length	Position	Cover	Cover	Cover	Cover
1							
'		600 mm	Center v	25 mm			25 mm

Opening Diagonal Rebar

Opening Diagonal Rebar refers to diagonal bars at the corners of an opening.

R Wall Reinforcement Configurations - 🗆 X										
Configuration:	opening reinforcement	 ✓ Sav 	ve Save As Rename D	elete						
6	ommon settings	Opening E Configura	idge Rebar Opening Diagonal Rebar of ation	D pening U/O	-Stirrups					
E E	xternal reinforcement	Cour	nt Rebar Type	Bar Length	Position	Edge Cover	Interior Cover	Exterior Cover	End Cover	
# ##		1 2	▲ H12 ×	1000 mm	External and Internal	30 mm	321 mm	321 mm	30 mm	
l III	aternal reinforcement	2 1 - Symbolic	➡ H16	1200 mm	Center v	30 mm			30 mm	
	Vall opening einforcement		Internal							
	/all perimeter einforcement		•							

Settings are similar as in Opening Edge Rebar definition except for the following:

Bar Length - length of rebar. If there will be another wall edge within bar length distance - bar will be bended along that edge. Edge cover - cover from the corner of the opening to rebar



Opening U/O stirrups

You can define how U-shaped stirrups should be distributed around openings.

Wall Reinfor	rcement Configurations				-	
onfiguration:	External layer of sandwich	 Save Save As 	Rename Delete			
	·	Opening Edge Rebar Openi	ng Diagonal Rebar Opening U/O-Sti	rrups		
	ommon settings	Vortical Havingstal	Create openings bars			
E	xternal reinforcement	Verticul Tionzonitar	Top U-Stirrup reinforcement settings Top U-Stirrup reinforcement	Bottom U-Stirrup reinforcement settin Bottom U-Stirrup reinforcement Different from Top	ıgs	
m+++11		Rebar style:	Standard v	Standard	v	
.	nternal reinforcement	Rebar bar type:	Select from list v	Select from list	v	
		Rebar Hook Type:	No Hook v	No Hook	v	
		Rebar Hook Orientation:	Right v	Right	v	
** °	pening reinforcement	Bottom/Start cover:	13 mm	13 mm		
**		Top/End cover:	13 mm	13 mm		
P	erimeter reinforcement	External cover:	17 mm	17 mm		
		Internal cover:	17 mm	17 mm		
		A-segment length:	213 mm	213 mm		
		Step:	123 mm	123 mm		
		- First/Last Spacing				
		Distance:	11 mm	11 mm		
		Usage:	 Use for First Use for Last Use for Both 	Use for First Use for Last Use for Both		
			Top O-Stirrup reinforcement	Bottom O-Stirrup reinforcement		
			Top Opening O-Stirrup:	Bottom Opening O-Stirrup:		
		O-Stirrup hook type:	No Hook *	No Hook	v	
		O-Stirrup hook orientation:	Right v	Right	v	
	>					

Opening E	dge Rebar	Openi	ng Diagonal Rebar	Openin	ig U/O-Stii	rrups
			🖌 Create openin	gs bars		
Vertical	Horizontal					
			Top U-Stirrup rein	forcemen	it settings	Bottor

Create opening bars - if you want to create opening bars, turn ON. If not, switch OFF.

You can prepare different settings for vertical (top/bottom) and horizontal (left/right) reinforcement settings. Select the appropriate tab:

Opening E	dge Rebar	Opening Diagonal Rebar	Opening U/O-Stirr	ups
Vertical	Horizontal	✓ Create opening	ıs bars	
		Top U-Stirrup reinf	orcement settings	Bottor

Select where U-shaped rebar should be created and what settings should be used:

,		1 3			
Opening Edge Rebar Openin	ng Diagonal Rebar Opening U	J/O-Sti	rrups		
Vertical Horizontal					
	Top U-Stirrup reinforcement se Top U-Stirrup reinforcement	ettings nt	Bottom U-Stirrup reinforcement se Bottom U-Stirrup reinforcemen Different from Top	:ttings nt	
Rebar style:	StirrupTie	~	StirrupTie	~	
Rebar bar type:	H8	~	H8	v	
Rebar Hook Type:	No Hook	~	No Hook	v	
Rebar Hook Orientation:	Right	~	Right	v	
Bottom/Start cover:	30 mm		30 mm		
Top/End cover:	30 mm		30 mm		
External cover:	38 mm		38 mm		
Internal cover:	38 mm		38 mm		
A-segment length:	396 mm		396 mm		
Step:	400 mm		400 mm		
~ First/Last Spacing					
Distance:	50 mm		50 mm		
Usage	Use for First		Use for First		

Top U-Stirrup reinforcement – switch ON if you want to create U bar at the top of opening. **Bottom U-Stirrup reinforcement** – switch ON if you want to create U bar at the bottom of opening. **Different from Top** – switch ON if you want to make bottom rebar different than top rebar.

Rebar Style – Standard or StirrupTie options available. Recommended to use StirrupTie for U shape bar.

Rebar bar type – select from available rebar types in the project.

Rebar Hook Type - select hook type for U shape. Usually 'No Hook' will be selected.

Rebar Hook Orientation - choose direction of hook.

Bottom/Start cover – cover from corresponding opening edge.

Top/End cover - cover from corresponding opening edge.

External Cover – cover from external face of the wall layer.

Internal Cover – cover from internal face of the wall layer.

A-segment length – U bar length from the middle of short edge to the end of U legs.

U bar step – step of U bar along the edge of opening.

See explanatory images below:

Plan view:



Front view:



First/Last Spacing:

- First/Last Spacing		
Distance:	50 mm	50 mm
Usage:	 Use for First Use for Last Use for Both 	 Use for First Use for Last Use for Both

Distance - define distance from opening start/end to first rebar.

Use for First/Last - choose from which side of the wall rebar should be distributed.

Use for Both option works together with Minimal Rebar distance in common settings. Software will try to create rebar at start and end of the wall with defined distance, and then it will distribute bars from the start of the wall, and if last step is smaller than Minimal Rebar Distance, rebar at the end will be removed. (Check common settings description.)

O shape bars

O-shaped bars will be created instead of U bars if there is not enough space for U-shaped bars, for example between two openings:



Top/Bottom O-Stirrup reinforcement – turn ON if you want to create O bars instead of U bars if condition is met.
O-Stirrup hook type – choose from available hook types in the project.
O-Stirrup hook orientation – choose direction of hook.