



midas **Design**<sup>+</sup>

# USER GUIDE

for Batch Beam & Column Design

Solution for Structural Member Design with Drawing & Report

**MIDAS**

# INDEX

# USER GUIDE

## for Batch Beam& Column Design

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midas **Design**<sup>+</sup> 2024 (v1.1)

Solution for Structural Member Design  
with Drawing & Report



## 00. Introduction

- There are many inconveniences when performing design in Gen. For example, when a section needs to be added when grouping members or when the cross section needs to be increased according to design results, analysis and design should be performed again. Since these cases must be performed repeatedly, a lot of time and effort are required depending on the magnitude of the building.
- Batch Design is a design feature to provide convenience for these repetitive tasks in Gen, and the procedure is as follows.

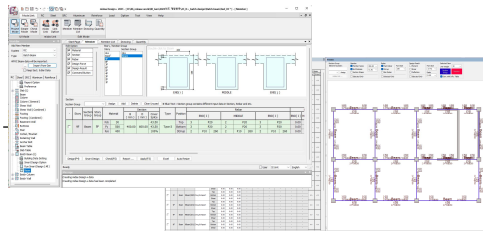
### [Gen] Modeling & Analysis & Design

- Create a model with simple section in Gen
- Perform an analysis
- Set a design condition and perform a design.



### [Design+] Import Design Data of Gen

- Section Name, Material, Section Size, Rebar.
- Design force.
- Design Setting (cover, design type).
- Design Condition (Seismic design).



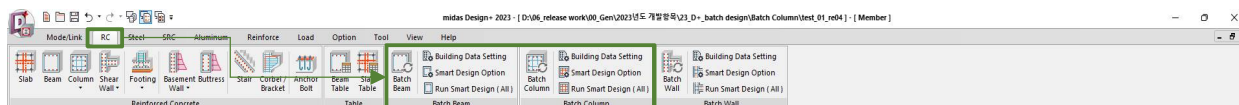


# 01 User Interface

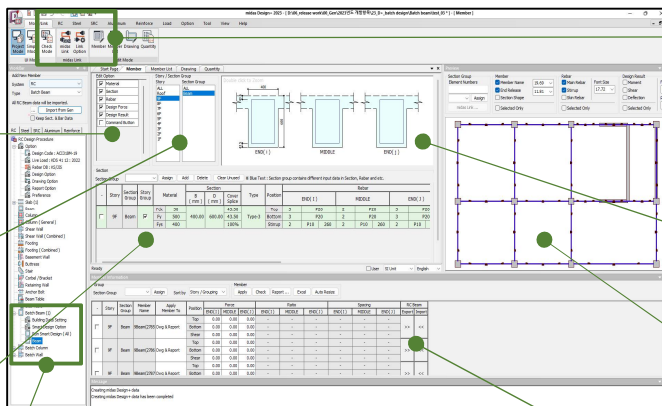


## Main UI

• UI layout and main functions for batch design are as follows.



Batch Design in main menu (RC > Batch Beam or Batch Column)



### Edit Option

Control the items in section table.

### Story/Section Group

Control how to display the section table.

### Section Table

Display the design data, design force and design result by each group.

User Interface for batch design

### Batch Design Data

- Set the design conditions by story.
- Set the option for smart design. (EN and IS codes are not supported.)
- Display the group names.

### midas Link

Link with midas Gen / All members are imported in batch design



### View Section

Display the section shape and rebar arrangement.

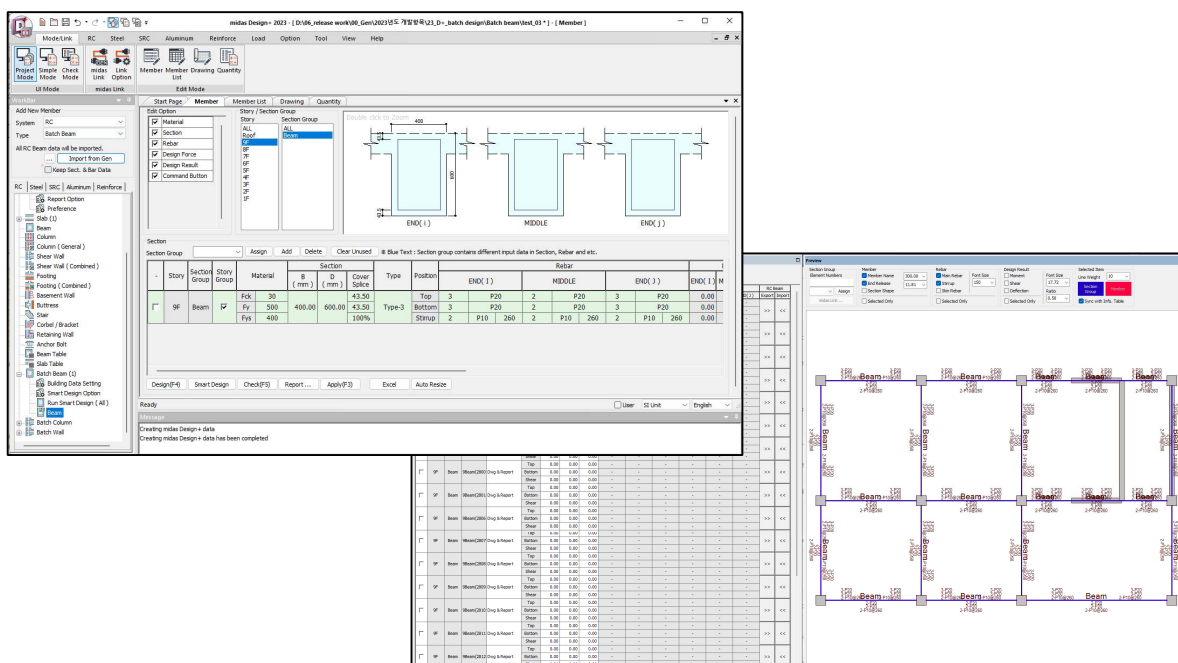
### Preview

Provides the simple drawings and design information. Group's change is also supported.

### Member Table

Display the design data, design force and design result by each group.

• If using a dual monitors, the member table and preview window can be placed separately.



Example of window placement



## 02 Main Features



### Edit Option

- Control the display for each item. By checking only the items necessary for the purpose, table information can be simplified.

**Edit Option**

- ☒ Material
- ☒ Section
- ☒ Rebar
- ☒ Design Force
- ☒ Design Result
- ☒ Command Button

**Story / Section Group**

Story	Section Group
ALL	ALL
Roof	Beam
4F	
3F	
1F	

Double click to Zoom

**Section**

Section Group: ALL Assign Add Delete Clear Unused \* Blue Text : Section group contains different input data in Section, Rebar and etc.

Story	Section Group	Story Group	Material	Section			Type	Position	Rebar			Force			Ratio			Spacing			RC Beam	Export	Import		
				B (mm)	D (mm)	Cover Splice			END(i)	MIDDLE	END(j)	END(i)	MIDDLE	END(j)	END(i)	MIDDLE	END(j)	END(i)	MIDDLE	END(j)					
Roof	Beam	<input checked="" type="checkbox"/>	Fck	30		43.50	Type-1	Top	2	P20	2	P20	2	P20	0.00	0.00	0.00	-	-	-	-	-	-	>>	<<
			Fy	500	400.00	600.00		Bottom	2	P20	2	P20	2	P20	0.00	0.00	0.00	-	-	-	-	-			
			Fys	400	100%	Stirrup		2	P10	300	2	P10	300	2	P10	300	0.00	0.00	0.00	-	-	-	-		
4F	Beam	<input checked="" type="checkbox"/>	Fck	30		43.50	Type-1	Top	2	P20	2	P20	2	P20	0.00	0.00	0.00	-	-	-	-	-	-	>>	<<
			Fy	500	400.00	600.00		Bottom	2	P20	2	P20	2	P20	0.00	0.00	0.00	-	-	-	-	-			
			Fys	400	100%	Stirrup		2	P10	300	2	P10	300	2	P10	300	0.00	0.00	0.00	-	-	-	-		
3F	Beam	<input checked="" type="checkbox"/>	Fck	30		43.50	Type-1	Top	2	P20	2	P20	2	P20	0.00	0.00	0.00	-	-	-	-	-	-	>>	<<
			Fy	500	400.00	600.00		Bottom	2	P20	2	P20	2	P20	0.00	0.00	0.00	-	-	-	-	-			
			Fys	400	100%	Stirrup		2	P10	300	2	P10	300	2	P10	300	0.00	0.00	0.00	-	-	-	-		

Section table when all items are checked

**Edit Option**

- ☐ Material
- ☒ Section
- ☒ Rebar
- ☒ Design Force
- ☒ Design Result
- ☒ Command Button

**Story / Section Group**

Story	Section Group
ALL	ALL
Roof	Beam
4F	
3F	
1F	

Double click to Zoom

**Section**

Section Group: ALL Assign Add Delete Clear Unused \* Blue Text : Section group contains different input data in Section, Rebar and etc.

Story	Section Group	Story Group	Material	Section			Type	Position	Rebar			Force			Ratio			Spacing			RC Beam	Export	Import	
				B (mm)	D (mm)	Cover Splice			END(i)	MIDDLE	END(j)	END(i)	MIDDLE	END(j)	END(i)	MIDDLE	END(j)	END(i)	MIDDLE	END(j)				
Roof	Beam	<input checked="" type="checkbox"/>	Fck	30		43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	-	-	-	>>	<<
			Fy	500	400.00	600.00		Bottom	2	P20	2	P20	2	P20	-	-	-	-	-	-	-			
			Fys	400	100%	Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	-	-			
4F	Beam	<input checked="" type="checkbox"/>	Fck	30		43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	-	-	-	>>	<<
			Fy	500	400.00	600.00		Bottom	2	P20	2	P20	2	P20	-	-	-	-	-	-	-			
			Fys	400	100%	Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	-	-			
3F	Beam	<input checked="" type="checkbox"/>	Fck	30		43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	-	-	-	>>	<<
			Fy	500	400.00	600.00		Bottom	2	P20	2	P20	2	P20	-	-	-	-	-	-	-			
			Fys	400	100%	Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	-	-			

Section table when three items are not checked



## 02 Main Features



### Story/Section Group

- This feature is to control the list of section tables.
- The section tables is determined by a combination of story and section group
- Examples of combinations below:

#### When selecting Story "All" + Section Group "Beam"

Edit Option

☐ Material

☒ Section

☒ Rebar

☐ Design Force

☒ Design Result

☐ Command Button

Story / Section Group

Story	Section Group
ALL	ALL
Roof	Beam
4F	G1
3F	G2
2F	G3
1F	WG1
	B1
	B2
	B1a

Double click to Zoom

Section

Section Group: Beam Assign Add Delete Clear Unused ※ Blue Text : Section group contains different input data in Section, Rebar and etc.

Story	Section Group	Story Group	Section			Type	Position	Rebar						Ratio			Spacing		
			B (mm)	D (mm)	Cover Splice			END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)			
4F	Beam	✓	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	-
					Bottom		2	P20	2	P20	2	P20	-	-	-	-	-	-	
					Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	
					100%		-	-	-	-	-	-	-	-	-	-			
3F	Beam	✓	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	
					Bottom		2	P20	2	P20	2	P20	-	-	-	-	-		
					Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	
					100%		-	-	-	-	-	-	-	-	-	-			

→ "Beam" group for all stories are displayed.

#### When selecting Story "Roof" + Section Group "All"

Edit Option

☐ Material

☒ Section

☒ Rebar

☐ Design Force

☒ Design Result

☐ Command Button

Story / Section Group

Story	Section Group
ALL	ALL
Roof	Beam
4F	G1
3F	G2
2F	G3
1F	WG1
	B1
	B2
	B1a

Double click to Zoom

Section

Section Group: Roof Assign Add Delete Clear Unused ※ Blue Text : Section group contains different input data in Section, Rebar and etc.

Story	Section Group	Story Group	Section			Type	Position	Rebar						Ratio			Spacing		
			B (mm)	D (mm)	Cover Splice			END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)			
Roof	G1	✓	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	-
					Bottom		2	P20	2	P20	2	P20	-	-	-	-	-		
					Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	
					100%		-	-	-	-	-	-	-	-	-				
Roof	G2	✓	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	
					Bottom		2	P20	2	P20	2	P20	-	-	-	-	-		
					Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	
					100%		-	-	-	-	-	-	-	-	-				
Roof	WG1	✓	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	
					Bottom		2	P20	2	P20	2	P20	-	-	-	-	-		
					Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	
					100%		-	-	-	-	-	-	-	-	-				
Roof	B1	✓	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	
					Bottom		2	P20	2	P20	2	P20	-	-	-	-	-		
					Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	
					100%		-	-	-	-	-	-	-	-	-				
Roof	B2	✓	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	
					Bottom		2	P20	2	P20	2	P20	-	-	-	-	-		
					Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	
					100%		-	-	-	-	-	-	-	-	-				
Roof	B1a	✓	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	-	-	-	-	-	
					Bottom		2	P20	2	P20	2	P20	-	-	-	-	-		
					Stirrup		2	P10	300	2	P10	300	2	P10	300	-	-	-	
					100%		-	-	-	-	-	-	-	-	-				

→ All groups for "Roof" are displayed.





## 02 Main Features



### Section Table

- Design information is managed on a group basis. The role of 'Section Table' is as follows.
  - The material, section, and rebar information can be modified to run the design, and the design results can be checked based on the modified information.
  - It supports freely creating a new group name and changing the selected group to another group name.

Section																								
Section Group				Assign	Add	Delete	Clear Unused	# Blue Text : Section group contains different input data in Section, Rebar and etc.																
-	Story	Section Group	Story Group	Material	B (mm)	D (mm)	Cover Splice	Type	Position	Rebar						Force			Ratio			Spacing		
										END(1)		MIDDLE		END(2)		END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)
□	Roof	G1	✓	Fcd	30		43.50	Type-3	Top	3	D22	3	D22	3	D22	170.84	12.83	223.56	OK(0.649)	OK(0.049)	OK(0.850)	OK(0.728)	OK(0.728)	OK(0.728)
				Fiy	500	400.00	43.50		Bottom	3	D22	3	D22	3	D22	52.94	238.64	37.17	OK(0.201)	OK(0.907)	OK(0.141)	OK(0.728)	OK(0.728)	OK(0.728)
				Fys	400		100%		Stirrup	2	D10	250	2	D10	250	2	D10	250	142.07	153.19	153.19	OK(0.588)	OK(0.635)	OK(0.635)
□	3F	G1	□	Fcd	30		43.50	Type-2	Top	3	D22	3	D22	3	D22	211.77	27.36	217.36	OK(0.805)	OK(0.104)	OK(0.000)	OK(0.728)	OK(0.728)	OK(0.000)
				Fiy	500	400.00	43.50		Bottom	3	D22	3	D22	3	D22	37.33	221.50	35.04	OK(0.142)	OK(0.842)	OK(0.000)	OK(0.728)	OK(0.728)	OK(0.000)
				Fys	400		100%		Stirrup	2	D10	250	2	D10	250	2	D10	250	150.78	138.77	154.27	OK(0.625)	OK(0.575)	OK(0.000)
□	2F	G1	✓	Fcd	30		43.50	Type-2	Top	3	D22	3	D22	3	D22	206.11	40.71	236.29	OK(0.783)	OK(0.155)	OK(0.000)	OK(0.728)	OK(0.728)	OK(0.000)
				Fiy	500	400.00	43.50		Bottom	3	D22	3	D22	3	D22	54.58	227.24	45.18	OK(0.207)	OK(0.864)	OK(0.000)	OK(0.728)	OK(0.728)	OK(0.000)
				Fys	400		100%		Stirrup	2	D10	250	2	D10	250	2	D10	250	145.74	145.45	149.69	OK(0.604)	OK(0.602)	OK(0.000)
Smart Design		Check(F5)		Report ...		Apply(F3)		Excel		Auto Resize														

### Section Table

- "Section Group" Box** : Enter a new group name or select an existing group name.
- Assign** : Change the groups checked in the table to the group name selected in the "Section Group" box.
- Add** : Add a new group name. To add, enter the group name in the "Section Group" box.
- Delete** : Delete a group names. If the group names were assigned the members, they cannot be deleted.
- Clear Unused** : Deletes all unassigned Group names at once.
- Table Column**
  - " "** : Select a target Group for a design and change of the group name.
  - Story** : Displays the location(story) to which the group belongs.
  - Section Group** : Displays the assigned group name.
  - Story Group** : Set a group between stories. When selected, as shown in the image above, G1 of 2F and 3F have the same design information, and G1 of Roof has separate design information.  
When creating a drawing, 2F and 3F are created as one cross-section, and when the cross-section is exported to Gen, the cross-section is set for the 2F and 3F. (See the tutorial for the batch beam design.)
  - Material** : Enter the material of the group.
  - Section** : Enter the dimensions of the cross-section and cover. (Only rectangular and circular shapes are supported.)
  - Type** : Select the type of rebar arrangement.
    - Type-3 : End(i) – Middle – End(j)    Type-2 : Both End – Middle    Type-1: All(one) Section
  - Position** : Displays the position on the cross-section corresponding to rebar and force information
  - Rebar** : Enter information about the rebar.
  - Force** : Display representative forces for the design force of all members included in the group.
  - Ratio** : Display Design ratios for axial, bending, and shear forces (Design force / Design strength).
  - Spacing** : Display the ratio between the spacing limit of rebar based on the code and the inputted rebar spacing.



### NOTE

#### What do the colors of cell and Text mean?

##### White Cell

- Activated. (Can be edited)

##### Blue Text (Bold)

- The members that make up the group each have different information, So the representative values are output.

-	Story	Section Group	Story Group	Material			Section		Main Bar					Corner		Hoop Bar				Force							
				Fcd (MPa)	Fy (MPa)	Fys (MPa)	Shape	Width (mm)	Height (mm)	Splice	No.	Rows	Name	Cc (mm)	Use	Name	End	Space (mm)	Middle	Space (mm)	Axial + Moment	Shear	Pux (kN)	Vux (kN)	Puy (kN)	Vuy (kN)	
	5F	Column	✓	30	500	400	Rectangle	500.00	500.00	0%	8	3	P20	63.50		✓	P10	210.00	P10	210.00	-72.01	-357.05	87.47	0.00	0.00	0.00	0.00
	4F	Column	✓	30	500	400	Rectangle	500.00	500.00	0%	8	3	P20	63.50		✓	P10	210.00	P10	210.00	-267.34	-362.64	49.21	0.00	0.00	0.00	0.00
	3F	Column	✓	30	500	400	Rectangle	500.00	500.00	0%	8	3	P20	63.50		✓	P10	210.00	P10	210.00	-476.81	354.55	-48.66	0.00	0.00	0.00	0.00
	2F	Column	✓	30	500	400	Rectangle	500.00	500.00	0%	8	3	P20	63.50		✓	P10	210.00	P10	210.00	2446.09	-190.58	168.59	0.00	0.00	0.00	0.00
	1F	Column	✓	30	500	400	Rectangle	500.00	500.00	0%	4	2	P20	63.50		✓	P10	300.00	P10	300.00	1000.00	1000.00	0.00	886.62	59.16	886.62	50.79

##### Red Text

- Conditions required for design are not met
- Strength, Rebar details, Serviceability

##### Green Cell

- Cell is selected. (Can be edited)

##### Gray Cell

- Deactivated. (Cannot be edited)



## 02 Main Features



### Member Table

- Display the design information about members constituting the group selected in the section table.
  - Section Information : Section, material, and rebar information
  - Design Information : Design force, design ratio and spacing for shear bar

Member Information																
Group					Member											
Section Group					<div><div></div></div>	Assign	Sort by		<div>Story / Grouping</div>	Apply	Check	Report ...	Excel	Auto Resize		
-	Story	Section Group	Member Name	Apply Member To	Position	Force			Ratio			Spacing			RC Beam	
						END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)	Export	Import
<input type="checkbox"/>	3F	B100	3Beam(62)	Dwg & Report	Top	101.97	25.59	88.95	OK(0.468)	OK(0.118)	OK(0.409)	OK(0.736)	OK(0.736)	OK(0.736)	>>	<<
					Bottom	36.38	36.38	33.71	OK(0.167)	OK(0.127)	OK(0.155)	OK(0.736)	OK(0.491)	OK(0.736)		
					Shear	76.97	49.78	74.21	OK(0.307)	OK(0.198)	OK(0.296)	OK(0.932)	OK(0.932)	OK(0.932)		
<input type="checkbox"/>	3F	B100	3Beam(63)	Dwg & Report	Top	95.63	23.48	97.62	OK(0.439)	OK(0.108)	OK(0.448)	OK(0.736)	OK(0.736)	OK(0.736)	>>	<<
					Bottom	26.09	27.37	27.37	OK(0.120)	OK(0.096)	OK(0.126)	OK(0.736)	OK(0.491)	OK(0.736)		
					Shear	73.59	46.58	73.78	OK(0.293)	OK(0.186)	OK(0.294)	OK(0.932)	OK(0.932)	OK(0.932)		

Member Table

- “Section Group” Box : Select Group Name.
- Assign : Change the selected groups in the table to the group name selected in the “Section Group” Box.
- Sort by : Select how to sort members according to the purpose of design. When sorting according to the design ratio, you can easily determine the separation or change of the group by checking the design results between members.
- Apply : Applies the modified value (design force) to the member.
- Check : A design check is performed according to the design information of group.
- Table Column
  - “-” : Select a target Group for design and change of group name.
  - Story : Displays the location(story) to which the group belongs.
  - Section Group : Displays the assigned group name.
  - Member Name : Story Name + Section Name in Gen + (Element No in Gen)  
It is used when exporting as a “RC Beam” or “RC Column” of D+. (See the image below.)
  - Force : Display representative forces for the design force of all members included in the group.
  - Ratio : Display Design ratios for axial, bending, and shear forces (Design force / Design strength).
  - Spacing : Display the ratio between the spacing limit of rebar based on the code and the inputted rebar spacing.
  - RC Beam (or Column) :
    - 1) Export : The design in detail can be reviewed by exporting design information to RC beam or column of Design+.  
→ Exported name : Story Name + Group Name + (Element No in Gen)
    - 2) Import : After detailed review in “RC Beam” or “RC Column”, the design results can be imported to Batch design.

The screenshot shows the 'Member Information' table with columns for Story, Section Group, Member Name, Apply Member To, Position, Force, Ratio, Spacing, and RC Beam. The table lists members 3Beam(74) and 3Beam(75) for story 3F and section group G2. The 'RC Beam' column has 'Export' and 'Import' buttons. A blue box highlights the 'Beam (3)' item in the left-hand menu, and a blue arrow points from it to the '3F' row in the table. Another blue box highlights the 'Export' button in the table, and a blue arrow points from it to the 'Batch Beam (8)' item in the menu.





## 02 Main Features

### Preview

- In the preview window, each story's structural plan and design information are output.
- In Preview,
  - Check the group name, rebar information, and design Result (Ratio)
  - Change the group name directly.
  - Link with the member table: check on/off for the selected members in preview

#### Section Group

- The element numbers selected in Gen are entered. And change the selected element in Gen to the new or the other group name.

#### Member

- Display the member(group) name and end release symbol. If a section shape is checked on, the beam lines are output in a double layer.

#### Rebar

- Display the rebar information.

#### Design Result

- Display the design ratio.

**Preview (Roof)**

Section Group: 19 26 34 41  
Element Numbers: G2  
Link... Assign

Member: Member Name: 300.00, End Release: 300.00, Section Shape: ☐ Selected Only

Rebar: Main Rebar: ☐ Moment, ☐ Shear, Stirrup: ☐ Skin Rebar: ☐ Selected Only

Design Result: Font Size: 450.00, Ratio: 0.50, Selected Only: ☐

Selected Item: Line Weight: 10, Section Group: Member, Sync with Info. Table: ☒

**Section Shape in Member**

G3

**Design Result**

0.245 G3 0.245

**Rebar**

3-D25, 3-D25, 2-D10@2502-D10@250, 3-D25, 2-D10@250

### Preview

- If checking on/off one or more members selected in the preview as shown below, the corresponding members are checked on/off in the member table.
- It is used to change the group name of members selected in the preview.

**Member Information**

Group: Section Group, Assign, Sort by: Story / Grouping, Member: Apply, Check, Report..., Excel, Auto Resize

Story	Section Group	Member Name	Apply Member To	Position	Force			Ratio			Spacing			RC Beam	
					END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)	END(1)	MIDDLE	END(2)	Export	Import
Roof	G1	RoofBeam(118)	Dwg & Report	Top	100.11	11.80	74.02	OK(0.296)	OK(0.035)	OK(0.219)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Bottom	10.16	72.49	29.64	OK(0.030)	OK(0.214)	OK(0.088)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Shear	74.92	66.45	62.38	OK(0.311)	OK(0.276)	OK(0.259)	OK(0.936)	OK(0.936)	OK(0.936)	>>	<<
Roof	G1	RoofBeam(119)	Dwg & Report	Top	170.84	12.83	109.68	OK(0.505)	OK(0.038)	OK(0.325)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Bottom	5.26	149.71	37.17	OK(0.016)	OK(0.443)	OK(0.110)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Shear	126.10	127.63	109.16	OK(0.565)	OK(0.530)	OK(0.453)	OK(0.936)	OK(0.936)	OK(0.936)	>>	<<
Roof	G1	RoofBeam(133)	Dwg & Report	Top	88.38	4.96	118.58	OK(0.261)	OK(0.015)	OK(0.351)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Bottom	38.96	110.30	17.62	OK(0.115)	OK(0.326)	OK(0.052)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Shear	70.76	72.67	83.04	OK(0.294)	OK(0.302)	OK(0.345)	OK(0.936)	OK(0.936)	OK(0.936)	>>	<<
Roof	G1	RoofBeam(134)	Dwg & Report	Top	157.07	0.00	221.23	OK(0.465)	OK(0.000)	OK(0.655)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Bottom	52.94	238.64	21.44	OK(0.157)	OK(0.706)	OK(0.063)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Shear	142.07	153.19	153.19	OK(0.590)	OK(0.636)	OK(0.636)	OK(0.936)	OK(0.936)	OK(0.936)	>>	<<
Roof	G1	RoofBeam(135)	Dwg & Report	Top	147.36	1.02	223.56	OK(0.436)	OK(0.003)	OK(0.661)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Bottom	45.38	219.94	9.45	OK(0.134)	OK(0.651)	OK(0.028)	OK(0.719)	OK(0.719)	OK(0.719)	>>	<<
				Shear	132.60	147.80	147.80	OK(0.551)	OK(0.614)	OK(0.614)	OK(0.936)	OK(0.936)	OK(0.936)	>>	<<

**Preview (Roof)**

Section Group: 19 26 34 41  
Element Numbers: G2  
Link... Assign

Member: Member Name: 300.00, End Release: 300.00, Section Shape: ☐ Selected Only

Rebar: Main Rebar: ☐ Moment, ☐ Shear, Stirrup: ☐ Skin Rebar: ☐ Selected Only

Design Result: Font Size: 200.00, Ratio: 0.50, Selected Only: ☐

Zoom (All)

Check ON ( Member Info. Table )  
Check OFF ( Member Info. Table )

Save As DWG File ...  
Save As EMF File ...  
Layer Setting ...

### Connection between Preview and Member Table

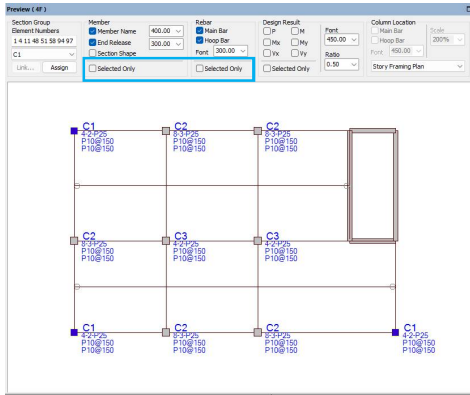


## 02 Main Features

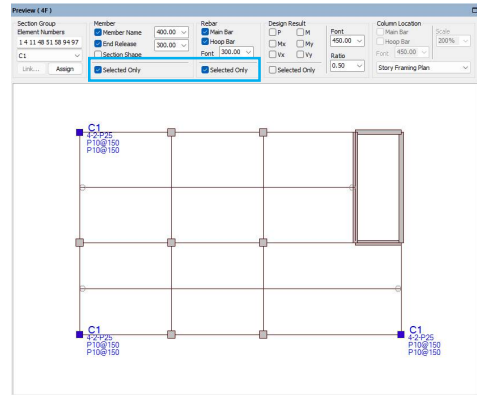


### Preview

- **Selected Only** : Only information about the group selected in the section table is output.

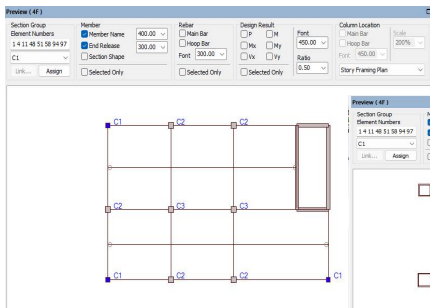


When checking off "Selected Only"



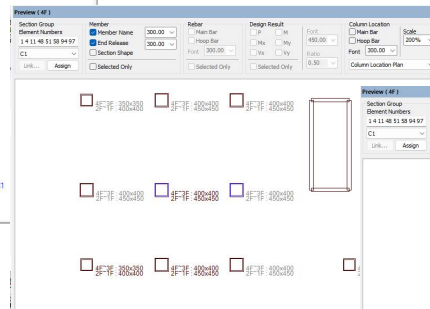
When checking on "Selected Only"

- **View Type** : the information for columns is provided in three types as follows. It is supported only in batch columns.



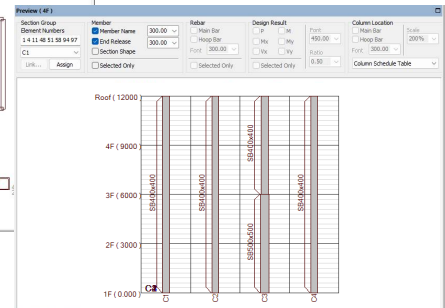
Story Frame Plan

- Group Name
- Rebar Information
- Design Result (Ratio)



Column Location Plan

- Group Name
- Column outline for all story
- Story & Size



Column Schedule Table

- Group Name
- Column outline for all story
- Story & Size

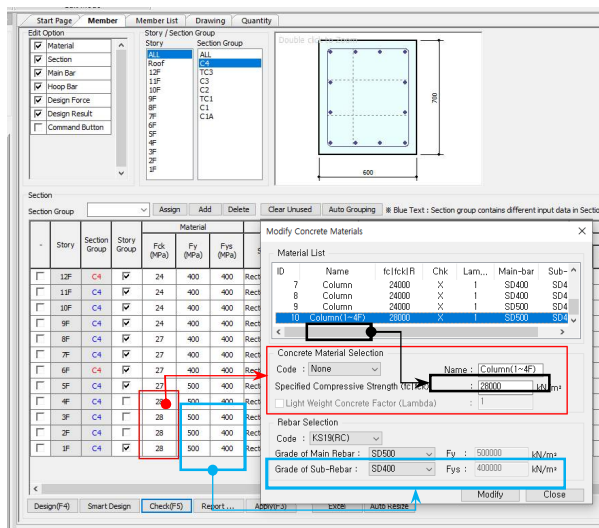
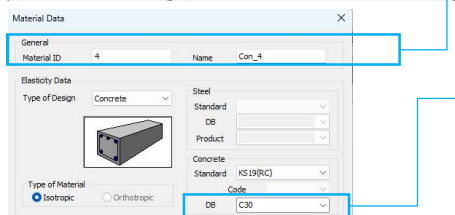
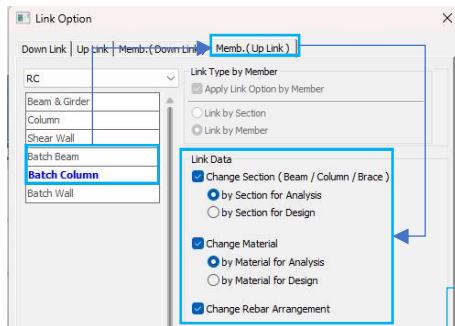


## 02 Main Features



### NOTE

#### How to export the material data of batch design to Gen model.




- First, the link option ("Up Link" tab) should be set before exporting to Gen.
  - For Analysis(recommendation) : Update the concrete & rebar materials and sections in the batch design to Gen
  - For Design : Update only the concrete & rebar for design and section for design to Gen (not update materials and sections for the analysis model)
- New materials added by modifying the material in 'Batch Design' are added to the material list of Gen according to the rules below.
  - Con\_(added Material ID number)
- For added materials, material DB is automatically assigned by finding the DB matched to the concrete strength of 'Batch Design'. If there is no same DB, the user type("None") in DB is set and the calculated values are inputted in properties.
- Design strength is controlled in the "Modify Concrete Material" function as shown in the image below.
  - In the case of concrete, the code is set to "None" and the name is applied the same as the material name.
  - The strength of concrete is determined by 'Fck' value of batch design.
  - The strength of the Rebar is automatically assigned by finding the DB with the value most similar to the rebar strength of Batch Design.

#### Shear Design at middle of column

- The shear design at the middle of the column is not supported.
- When performing the design, The diameter and spacing of a hoop at the middle follow these of the end
- Therefore, the user has to input the hoop's spacing at the middle.

#### How to check on the lists in table quickly

- After clicking the target box, use the shortcut key : Ctrl + Up or Down key



**Ctrl+Up**

	Story	Section Group	Story Group	Material	Section			Type	Position	Rebar						Force			
					B (mm)	D (mm)	Cover Splice			END(1)		MIDDLE		END(2)		END(1)	MIDDLE	END(2)	
	Roof	Beam	✓	Fck 30	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	0.00	0.00	0.00	
				Fy 500					43.50	Bottom	2	P20	2	P20	2	P20	0.00	0.00	0.00
				Fys 400					43.50	Startup	2	P10	300	2	P10	300	2	P10	300
4F	Beam	✓	Fck 30	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	0.00	0.00	0.00		
			Fy 500					43.50	Bottom	2	P20	2	P20	2	P20	0.00	0.00	0.00	
			Fys 400					43.50	Startup	2	P10	300	2	P10	300	2	P10	300	0.00
3F	Beam	✓	Fck 30	400.00	600.00	43.50	Type-1	Top	2	P20	2	P20	2	P20	0.00	0.00	0.00		
			Fy 500					43.50	Bottom	2	P20	2	P20	2	P20	0.00	0.00	0.00	
			Fys 400					43.50	Startup	2	P10	300	2	P10	300	2	P10	300	0.00



# 03.

## **Tutorial - Batch Beam Design**

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STEP 01

**Setting in midas Gen**

STEP 02

**Import from Gen**

STEP 03

**Generation of Beam Group**

STEP 04

**Detailed Grouping**

STEP 05

**Detailed Design & Drawing**

STEP 06

**Export to Gen**

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# USER GUIDE

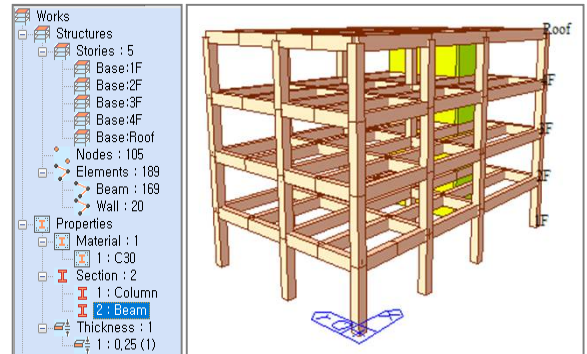


## Example Model

## Building Information

Magnitude		4-Story
Floor Load	Roof	DL : 10kN/m <sup>2</sup> LL : 3kN/m <sup>2</sup>
	2F~4F	DL : 6kN/m <sup>2</sup> LL : 3kN/m <sup>2</sup>

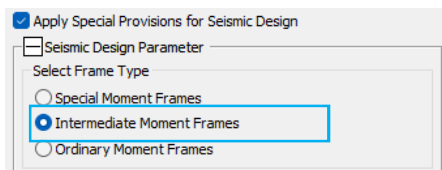
- For beams, create and assign only the "Beam" (400\*600) in the section list.



## Design Conditions

- Batch design is executed by receiving design information from Gen, so design setting and code design or code checking must be performed in Gen first.
- Some of the setting information below is reflected in the batch design settings of Design+, so confirmation is required.

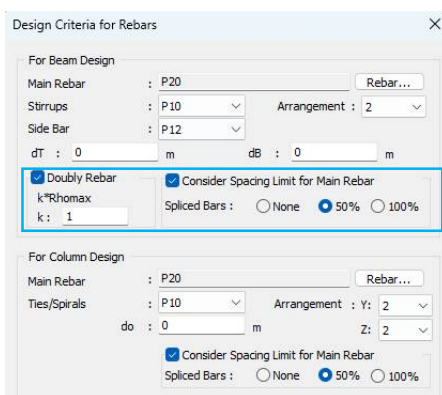
## - Seismic Design Parameter in Design Setting.



## Batch Beam &gt; Member List

Start Page		Member		Drawing		Quantity		Seismic Design	
CHK	Story	Group	Member Name	Splice	Crack Condition	CHK	Type	Pileis Guideline	
	Roof	G1	RoofBeam(118)	100%	-	<input checked="" type="checkbox"/>	IMP	<input type="checkbox"/>	
	Roof	G1	RoofBeam(119)	100%	-	<input checked="" type="checkbox"/>	IMP	<input type="checkbox"/>	

## - Seismic Design Parameter in Design Setting.



## Batch Beam &gt; Member List

Start Page		Member		Drawing		Quantity		Skin Bar	
CHK	Story	Group	Member Name	Type	Shape	Slab THK (mm)	Eff. Width (m)	Skin Bar	Splice
	Roof	Beam	RoofBeam(157)	Double	Rect	150.00	0.60	0 P12	T-Zone 50%
	Roof	Beam	RoofBeam(158)	Double	Rect	150.00	0.60	0 P12	T-Zone 50%

- If rebar information exists in Gen, this information is exported to a batch design even if 'Code Design' in Gen is run. If there is none, the rebar information by 'Code Design' is exported.



# Import from Gen

1. Change the design code and Rebar DB.  
(EN and IS codes are not supported.)

2. Click "midas Link" and select the target midas Gen.

3. Select "Batch Beam" in type.

4. Click "Import".

5. Check the imported information in the tree and Story/Section Group box.

**TIP**  
If using the dual or large monitor, it is efficient to re-arrange the member table and preview window. (See Page 4.)

6. Double-click "Building Data Setting".

7. Modify the design information for each story in batches.

**TIP**  
**Group Select**  
- Since the same floor load is applied to the 2<sup>nd</sup> to 4<sup>th</sup> stories, these stories are set as one group.

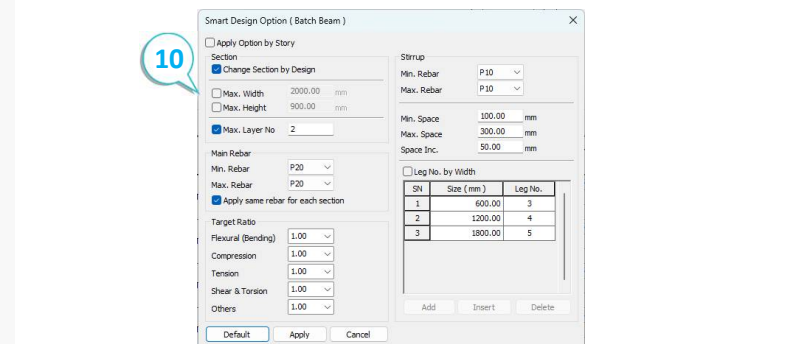
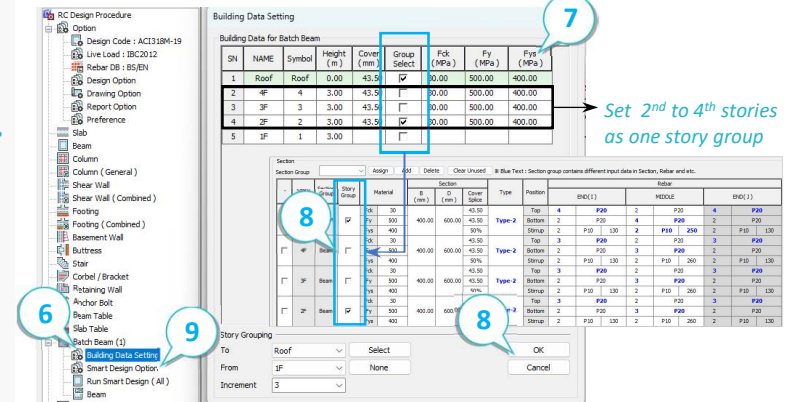
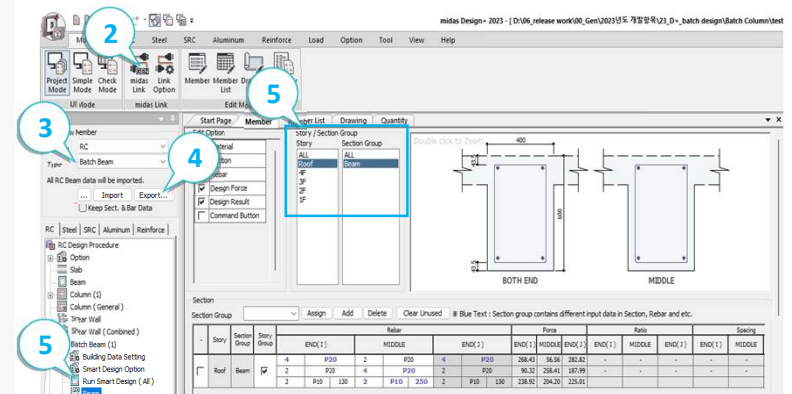
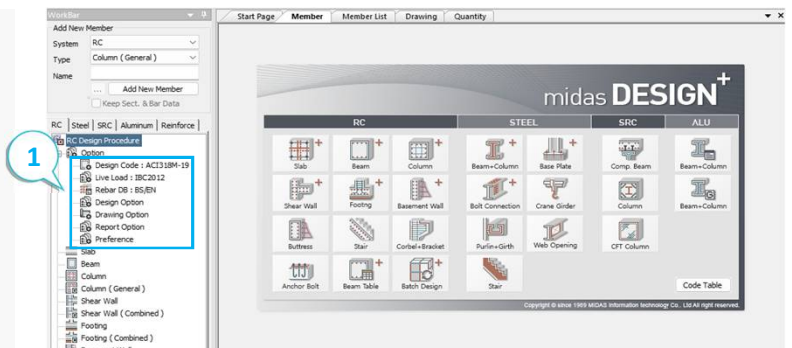
- How to generate a story group  
: If setting the 2<sup>nd</sup> to 4<sup>th</sup> stories as one story group, check on only the lowest story, 2F, and set the upper stories to off.

- What is a story group?  
: This function groups stories that are judged to have similar structural plans and design results due to the same floor load being applied. And the same design information is applied in the story group.

8. Click "O.K." and check the story group in the section table.

9. Double-click "Smart Design Option".

10. Modify the design condition for smart design.



# Generation of Beam Group

1. Input the new group name.

2. Click "Add"



*Creating multiple group names in advance would be efficient by repeating 1 and 2.*

3. Select the target Members in the preview.

4. Click "Check on (Member Info. Table)" and check the selection status in the member table.

5. Select the target group name and click "Assign"

6. Check the modified group name.

7. Repeat 3~6 step.



*3 to 7 are roughly the process of creating a group based on the engineer's judgment.*



*In Preview, the grouping work must be done one story at a time, so it takes much time to edit all stories.*

*If the link with Gen is maintained, select target members from Gen as shown on the right (8). Then the selected element No. is entered in Preview (9). Afterward, select the group name and click Assign (9). To edit multiple stories at once it is the more efficient method by using the Gen model.*

Batch Beam (8)

Building Data Setting

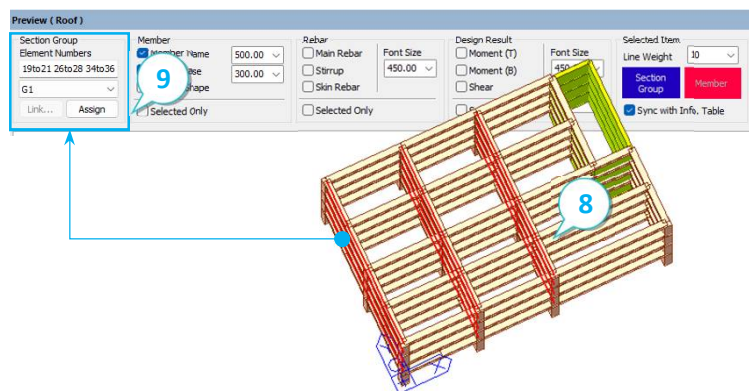
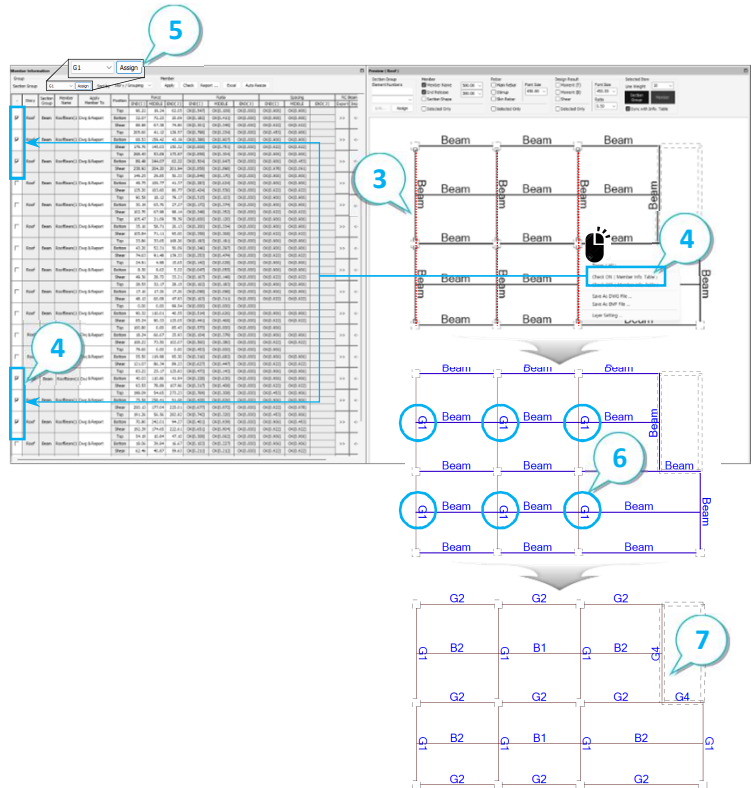
Smart Design Option

Run Smart Design (All)

Beam

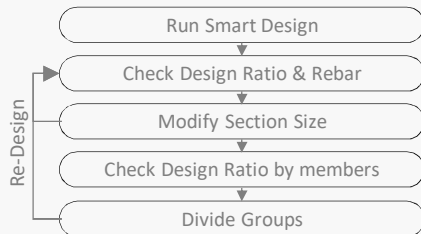
- G1
- G2
- G3
- G4
- B1
- B2
- B3

Section		Section				Section		
Section Group		G1	Assign	Add	Delete	Clear Unused		
Story	Section Group	Story Group	Material	B (mm)	D (mm)	Cover Splice	Type	Position
Roof	Beam	✓	Fck 30	400.00	600.00	43.50	Type-2	Top
			Fys 500			43.50		Bottom
4F	Beam	┐	Fys 400	400.00	600.00	50%	Type-2	Stirrup
			Fck 30			43.50		Top
3F	Beam	┐	Fys 400	400.00	600.00	50%	Type-2	Bottom
			Fck 30			43.50		Top
2F	Beam	┐	Fys 500	400.00	600.00	43.50	Type-2	Bottom
			Fys 400			50%		Stirrup
	Beam	✓	Fck 30	400.00	600.00	43.50	Type-2	Top
			Fys 500			43.50		Bottom
			Fys 400			50%		Stirrup



## Detailed Grouping

## The sequence of detailed grouping task



\* The above sequence is an example of a general procedure and can be used for various purposes and methods.

1. Select "All" in the story box and target group name in the section group box

2. Run "Smart Design"



**TIP**  
If all groups or members are checked off in "-", the design is performed with all.

3. Adjust the cross-section size by referring to the design result and the amount of rebar and perform "Smart Design" again. Determine the cross-section through the repeat of 2-3.

4. Check on design result in Preview and enter 0.7 in Ratio.



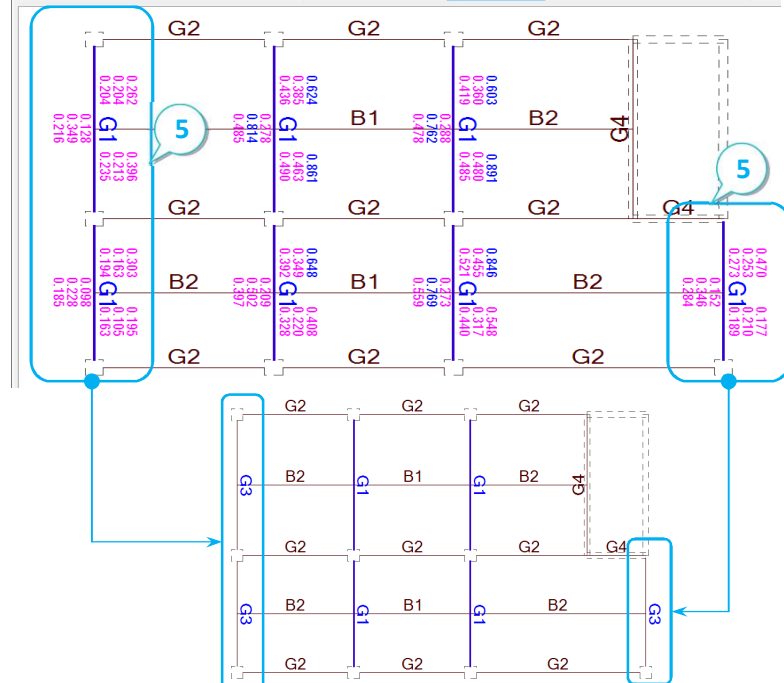
**TIP**  
If it is greater than the ratio, it is displayed in blue; if it is less than the ratio, it is displayed in pink. If it is over 1.0, the text is displayed in red.

The ratio is helpful when finding members in a group whose design results are significantly different and assigning them to a different group name.

5. Select members with results smaller than the ratio and assign them to another group. Conversely, the members with results greater than the ratio can be assigned to another Group.

6. Repeat 1 to 5 to perform a detailed grouping task.

-	Story	Section Group	Story Group	Material	Section			Type	Position	Rebar					
					B (mm)	D (mm)	Cover Splice			END(1)			MIDDLE		
□	Roof	G1	✓	Fck 30	400.00	550.00	43.50	Type-2	Top 5	P20		3		P20	
				Fys 500			43.50		Bottom 3	P20		5		P20	
				Fys 400			50%		Stirrup 2	P10	71	2	P10	100	
□	4F	G1	□	Fck 30	350.00	500.00	43.50	Type-2	Top 4	P20		3		P20	
				Fys 500			43.50		Bottom 3	P20		4		P20	
				Fys 400			50%		Stirrup 2	P10	59	2	P10	100	
□	3F	G1	□	Fck 30	350.00	500.00	43.50	Type-2	Top 4	P20		3		P20	
				Fys 500			43.50		Bottom 3	P20		4		P20	
				Fys 400			50%		Stirrup 2	P10	59	2	P10	100	
□	2F	G1	✓	Fck 30	350.00	500.00	43.50	Type-2	Top 4	P20		3		P20	
				Fys 500			43.50		Bottom 3	P20		4		P20	
				Fys 400			50%		Stirrup 2	P10	59	2	P10	100	



**The sequence of detailed design**

1. Run "Smart Design".
2. Check the design result & rebar Info.
3. Modify the rebar Info.
4. Click "Check"
5. Repeat 2~4 until the design is satisfied.
6. Click "Drawing" Tap to generate the beam list drawing.
7. Click "Create" button after selecting "RC"- "Batch Beam".
8. Check whether the list has been created according to the story group.
9. Click "Quantity" Tap to generate the beam quantity table.
10. Click "Create" button after selecting "RC"- "Batch Beam".



**TIP**  
When reviewing the optimal floor structural system, batch beam design allows a quick design and a quick quantity review.

Section Group:  Assign Add Delete Clear Unused   <

Story	Section Group	Story Group	Material	Section			Type	Position	Rebar						Ratio		
				B (mm)	D (mm)	Cover Splice			END(1)		MIDDLE		END(2)		END(1)		MIDDLE
Roof	G1	✓	Fck	30		43.50	Type-3	Top	5	P20	3	P20	5	P20	OK(0.846)	OK(0.286)	OK(0.811)
			Fy	500	400.0	550.00		Bottom	3	P20	5	P20	5	P20	OK(0.815)	OK(0.814)	OK(0.460)
			Fys	400	50%	50%		Stirrup	2	P10	120	2	P10	120	OK(0.862)	OK(0.680)	OK(0.680)
			Fys	400	50%	50%		Stirrup	2	P10	120	2	P10	120	OK(0.862)	OK(0.680)	OK(0.680)
4F	G1	✓	Fck	30		43.50	Type-3	Top	4	P20	2	P20	4	P20	OK(0.908)	OK(0.347)	OK(0.854)
			Fy	500	350.0	500.00		Bottom	2	P20	4	P20	2	P20	OK(0.579)	OK(0.796)	OK(0.544)
			Fys	400	50%	50%		Stirrup	2	P10	100	2	P10	100	OK(0.533)	OK(0.703)	OK(0.559)
			Fys	400	50%	50%		Stirrup	2	P10	100	2	P10	100	OK(0.533)	OK(0.703)	OK(0.559)
3F	G1	✓	Fck	30		43.50	Type-3	Top	4	P20	2	P20	4	P20	OK(0.850)	OK(0.342)	OK(0.894)
			Fy	500	350.0	500.00		Bottom	2	P20	4	P20	2	P20	OK(0.533)	OK(0.811)	OK(0.576)
			Fys	400	50%	50%		Stirrup	2	P10	100	2	P10	100	OK(0.533)	OK(0.693)	OK(0.536)
			Fys	400	50%	50%		Stirrup	2	P10	100	2	P10	100	OK(0.533)	OK(0.693)	OK(0.536)
2F	G1	✓	Fck	30		43.50	Type-3	Top	4	P20	2	P20	4	P20	OK(0.896)	OK(0.363)	OK(0.950)
			Fy	500	350.0	500.00		Bottom	2	P20	4	P20	2	P20	OK(0.489)	OK(0.815)	OK(0.605)
			Fys	400	50%	50%		Stirrup	2	P10	100	2	P10	100	OK(0.574)	OK(0.725)	OK(0.541)
			Fys	400	50%	50%		Stirrup	2	P10	100	2	P10	100	OK(0.574)	OK(0.725)	OK(0.541)
Smart Design			Check(F5)	Report ...	Apply(F3)	Excel	6	size									

Start Page Member Member List Drawing Quantity

Frame [ByLayer] [ByLayer] [BYLAYER]

### RC BEAM & GIRDER LIST

NAME	END( INT. )	CENTER	END( EXT. )
RoofG1 ...			
(400x550)			
TOP BAR	5-P20	3-P20	5-P20
BOT BAR	3-P20	5-P20	3-P20
STIRRUP	2-P10@120	2-P10@240	2-P10@120
COMMENT			
4-2G1 ...			
(350x500)			
TOP BAR	4-P20	2-P20	4-P20
BOT BAR	2-P20	4-P20	2-P20

Command: Redraw  
Command: Open

Command: RC Batch Beam Create Save As... Print List

Start Page	Member	Member List	Drawing	Quantity																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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## Export to Gen

1. Click "Export".

2. Check on the target stories and groups.

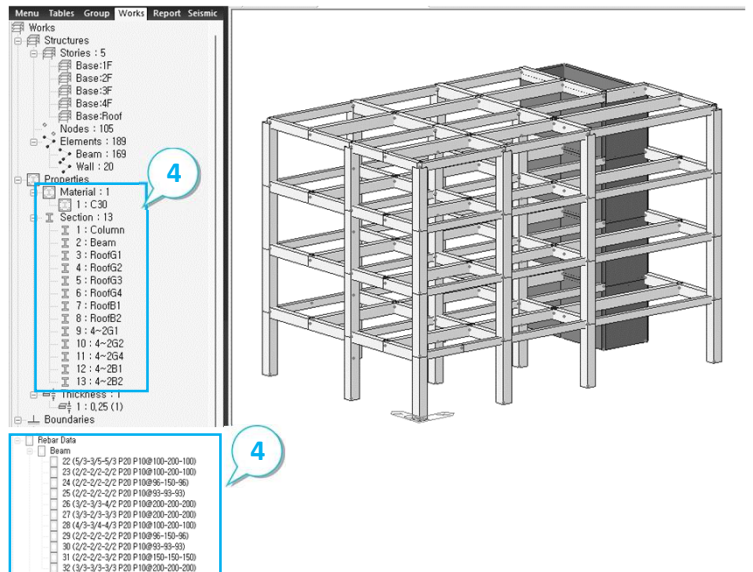
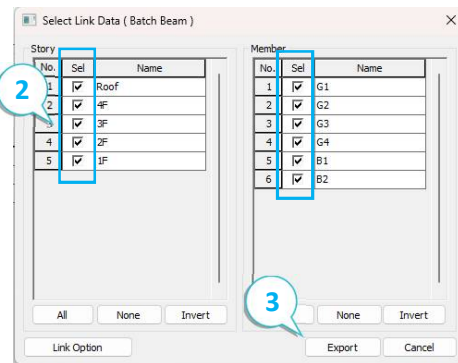
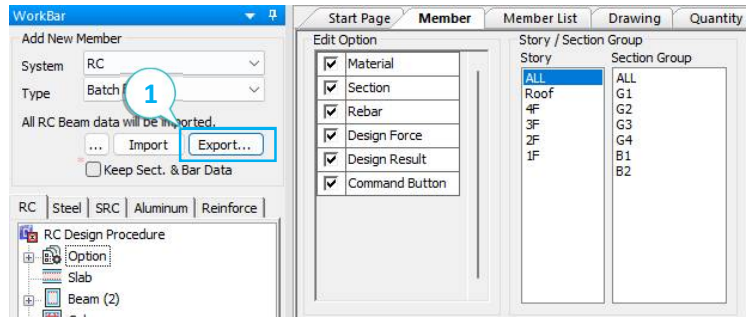
3. Click "Export".

4. Check the uploaded materials, sections, and rebar information.



**TIP**  
When the cross-section and material are modified, the member forces will be changed due to the model's stiffness changes. So the design results must be checked again through re-analysis and re-design (Code Check).

Alternatively, Batch beam design can be used to re-design and upgrade design data again.







# 04.

## **Tutorial - Batch Column Design**

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STEP 01

**Setting in midas Gen**

STEP 02

**Import from Gen**

STEP 03

**Generation of Beam Group**

STEP 04

**Detailed Grouping**

STEP 05

**Detailed Design & Drawing**

STEP 06

**Export to Gen**

---

# USER GUIDE

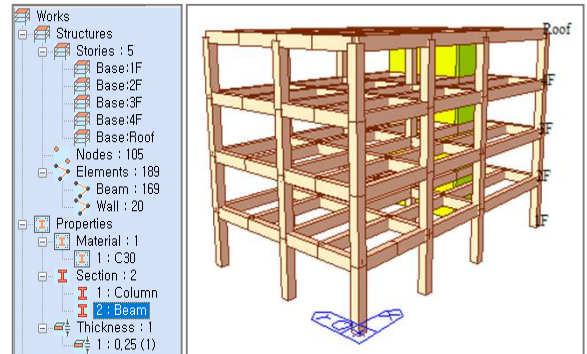


## Example Model

## Building Information

Magnitude		4-Story
Floor Load	Roof	DL : 10kN/m <sup>2</sup> LL : 3kN/m <sup>2</sup>
	2F~4F	DL : 6kN/m <sup>2</sup> LL : 3kN/m <sup>2</sup>

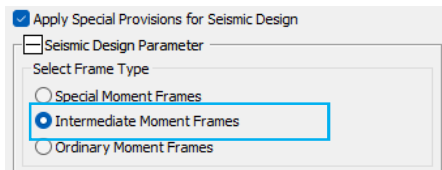
- For Columns, create and assign only the "Column" (500\*500) in the section list.



## Design Conditions

- Batch design is executed by receiving design information from Gen, so design setting and code design or code checking must be performed in Gen first.
- Some of the setting information below is reflected in the batch design settings of Design+, so confirmation is required

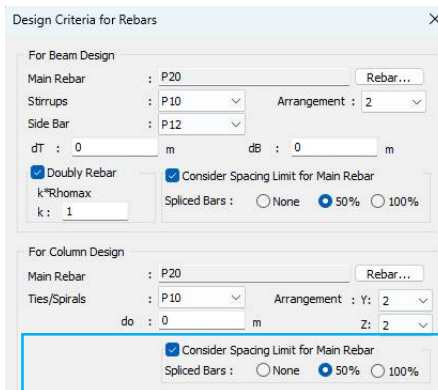
## - Seismic Design Parameter in Design Setting.



## Batch Column &gt; Member List

Start Page		Member	Member List	Drawing	Quantity	Seismic Design					Design Option		
CHK	Story	Group	Member Name	Factor			CHK	Type	Plots Provisions	Plots Guideline	CHK	Minimum Ratio	Maximum Ratio
				Cmx	Cmy	βd							
<input checked="" type="checkbox"/>	4F	C1	4Column(1)	0.850	0.850	0.765	<input checked="" type="checkbox"/>	IMF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.000	0.000
<input checked="" type="checkbox"/>	4F	C1	4Column(1)	0.850	0.850	0.761	<input checked="" type="checkbox"/>	IMF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.000	0.000
<input checked="" type="checkbox"/>	4F	C1	4Column(1)	0.850	0.850	0.762	<input checked="" type="checkbox"/>	IMF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.000	0.000
<input checked="" type="checkbox"/>	4F	C2	4Column(1)	0.850	0.850	0.756	<input checked="" type="checkbox"/>	IMF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.000	0.000
<input checked="" type="checkbox"/>	4F	C2	4Column(1)	0.850	0.850	0.756	<input checked="" type="checkbox"/>	IMF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.000	0.000
<input checked="" type="checkbox"/>	4F	C2	4Column(1)	0.850	0.850	0.756	<input checked="" type="checkbox"/>	IMF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.000	0.000

## - Seismic Design Parameter in Design Setting.



## Batch Column &gt; Member List

Start Page		Member	Member List	Drawing	Quantity	Main Bar						
CHK	Story	Group	Member Name	Maximum Ratio	Splice	Layer 1						
						No	Rows	Main	Cc (mm)	Use Corner	Corner	
✓	4F	Column	4Column(1)	0.000	50%	8	3	P20	63.50	✓	P20	
✓	4F	Column	4Column(1)	0.000	50%	8	3	P20	63.50	✓	P20	
✓	4F	Column	4Column(1)	0.000	50%	8	3	P20	63.50	✓	P20	

- If rebar information exists in Gen, this information is exported to a batch design even if 'Code Design' in Gen is run. If there is none, the rebar information by 'Code Design' is exported.

# Import from Gen

1. Change the design code and Rebar DB.  
(EN and IS codes are not supported.)

2. Click "midas Link" and select the target midas Gen.

3. Select "Batch Column" in type.

4. Click "Import".

5. Check the imported information in the tree and Story/Section Group box.

**TIP**  
If using the dual or large monitor, it is efficient to re-arrange the member table and preview window. (See Page 4.)

6. Double-click "Building Data Setting".

7. Modify the design information for each story in batches.

**TIP**  
Group Select  
- Considering constructability, story groups are set for two group  
: 1<sup>st</sup> to 2<sup>nd</sup> stories and 3<sup>rd</sup> to 4<sup>th</sup> Stories.

- How to generate a story group  
: If setting the 1<sup>st</sup> to 2<sup>nd</sup> stories as one story group, check on only the lowest story, 1F, and set the upper stories, 2F, to off.

- What is a story group?  
: This is a feature that groups together stories that are judged to have similar design results in consideration of constructability.

And the same design information is applied in the story group.

8. Click "O.K." and check the story group in the section table.

9. Double-click "Smart Design Option".

10. Modify the design condition for smart design.

**midas DESIGN+ Start Page**

**RC Design Procedure**

- Design Code : ACI318M-19
- Live Load : IBC2012
- Rebar DB : BS/EN
- Design Option
- Drawing Option
- Report Option
- Preference

**Batch Column**

SN	NAME	Symbol	Height (m)	Group Select	Fck (MPa)	Fy (MPa)	Fys (MPa)
1	Roof	Roof	0.00		30.00	500.00	400.00
2	4F	4	3.00		30.00	500.00	400.00
3	3F	3	3.00		30.00	500.00	400.00
4	2F	2	3.00		30.00	500.00	400.00
5	1F	1	3.00		30.00	500.00	400.00

**Building Data Setting**

Section Group	Material	Shape	Width (mm)	Height (mm)	Splice	No.	Rows	Name	Cc (mm)	Corner	End	Start	End	Start	End
4F	Column	Rectangle	400.00	400.00	0%	8	3	P25	63.50	1"	P10	75.00	P10	150.00	
3F	Column	Rectangle	400.00	400.00	0%	8	3	P25	63.50	1"	P10	75.00	P10	150.00	
2F	Column	Rectangle	350.00	350.00	0%	8	3	P25	63.50	1"	P10	75.00	P10	150.00	
1F	Column	Rectangle	350.00	350.00	0%	8	3	P25	63.50	1"	P10	75.00	P10	150.00	

**Smart Design Option (Batch Column...)**

☐ Apply Option by Story

☐ Change Section by Design

☐ Max. Width 2000.00 mm

☐ Max. Height 2000.00 mm

☐ Max. Rho 4.00 %

☐ Use Design Method of Gen/ADS

**Main Rebar**

Min. Rebar P20

Max. Rebar P20

**Hoop Rebar**

Min. Rebar P10

Max. Rebar P10

**Min. Space 100.00 mm**

**Max. Space 300.00 mm**

**Space Inc. 50.00 mm**

**Target Ratio**

Flexural (Bending) 1.00

Compression 1.00

Tension 1.00

Shear & Torsion 1.00

Others 1.00

**Default Apply Cancel**



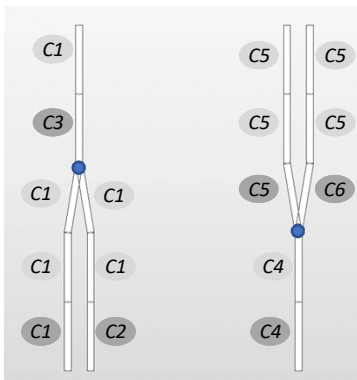
## NOTE

**Group Name in Batch Column****1. Setting of Group Name when exporting from Gen to Batch Column**

- If it is a continuous column in the Gen model, it is determined to be a connected group and imported as a batch column. The section name of the lowest story of the connected group is automatically set to the group name in the batch column.

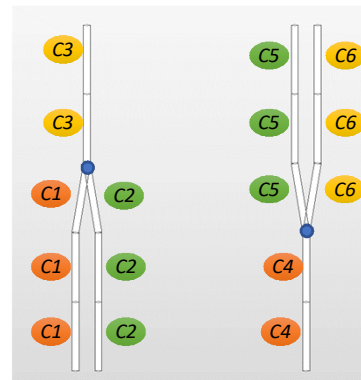
*\* In the case of continuous columns, they only have the same group name and cannot have different group names on a specific story.*

- If three or more columns are scattered or concentrated, they are not considered a connected group based on the corresponding node.



Section Name &amp; Assignment in Gen

Import  
from Gen



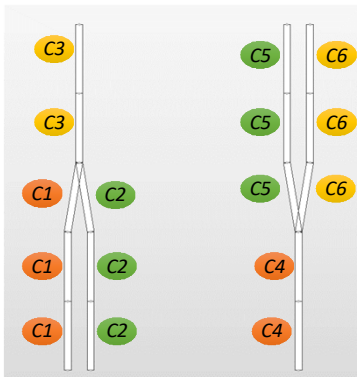
Assignment of Group Name in Design+

**2. How to apply the group name in Batch Column**

- In principle, continuous columns are applied as the same group.  
- Therefore, if the column group name of a specific story is changed, the group name of all story is changed simultaneously.

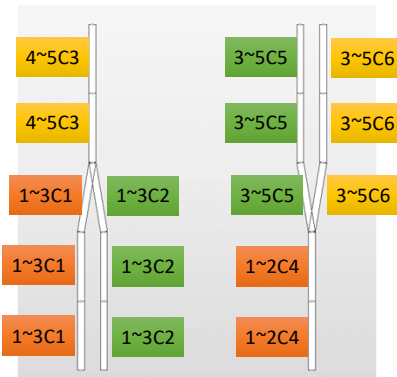
**2. How to apply the group name when exporting to Gen**

- Depending on the setting of story group, the story number or text is added in front of the group name as follows .



Assignment of Group Name in Design+

Export  
to Gen



Section Name &amp; Assignment in Gen

# Generation of Column Group

1. Input the new group name.

2. Click "Add"

**TIP**  
Creating multiple group names in advance would be efficient by repeating 1 and 2.

3. Select the target Members in the preview.

4. Click "Check on (Member Info. Table)" and check the selection status in the member table.

5. Select the target group name and click "Assign"

6. Check the modified group name.

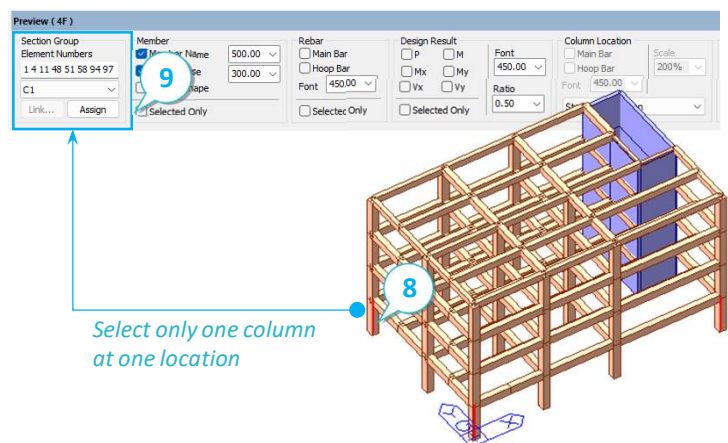
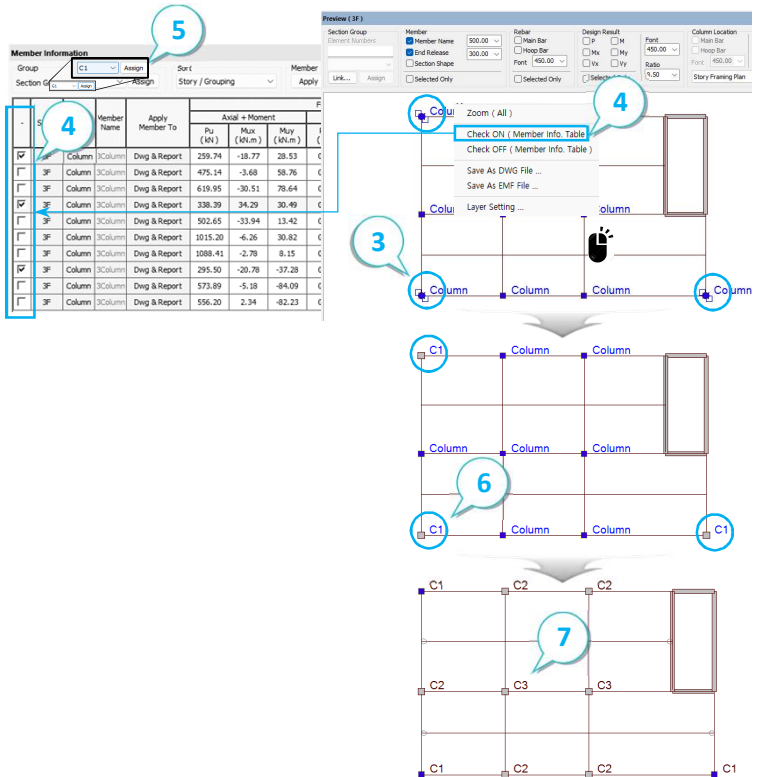
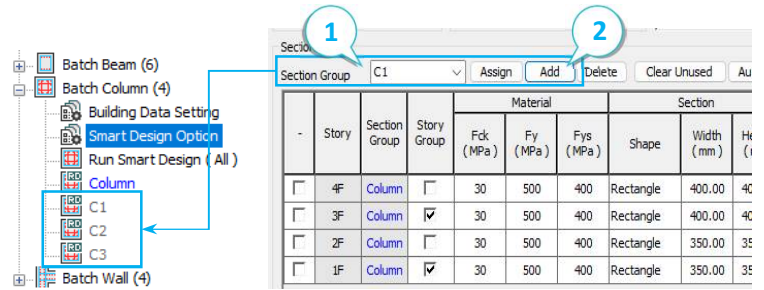
7. Repeat 3~6 step.

**TIP**  
3 to 7 are roughly the process of creating a group based on the engineer's judgment.

**TIP**  
In Preview, the grouping work must be done one story at a time, so it takes much time to edit all stories.

If the link with Gen is maintained, select target members from Gen as shown on the right (8). Then the selected element No. is entered in Preview (9). Afterward, select the group name and click Assign (9). To edit multiple stories at once it is the more efficient method by using the Gen model.

Since the consecutive columns have the same group name, it is not necessary to select the columns on all story.

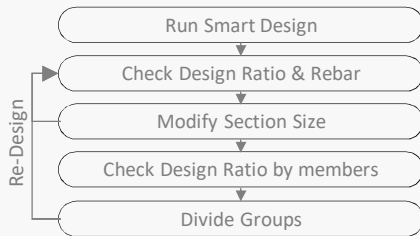


Select only one column at one location



## Detailed Grouping

## The sequence of detailed grouping task



\* The above sequence is an example of a general procedure and can be used for various purposes and methods.

1. Select "All" in the story box and target group name in the section group box

2. Run "Smart Design"



**TIP**  
If all groups or members are checked off in "-", the design is performed with all.

3. Adjust the cross-section size by referring to the design result and the amount of rebar and perform "Smart Design" again. Determine the cross-section through the repeat of 2-3.

4. Check on design result in Preview and enter 0.7 in Ratio.

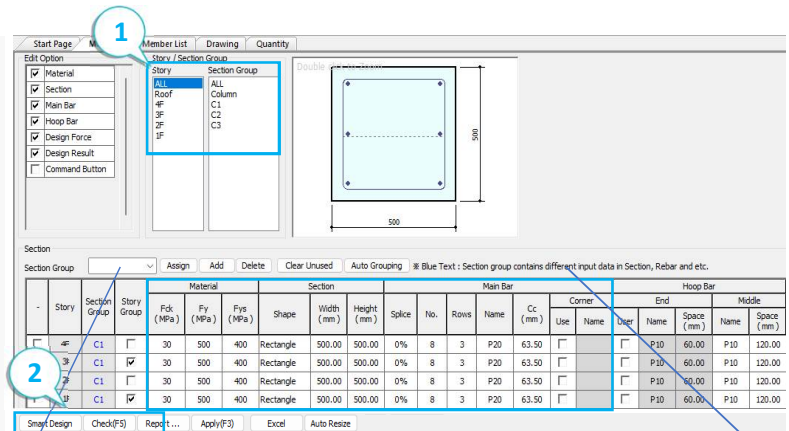


**TIP**  
If it is greater than the ratio, it is displayed in blue; if it is less than the ratio, it is displayed in pink. If it is over 1.0, the text is displayed in red.

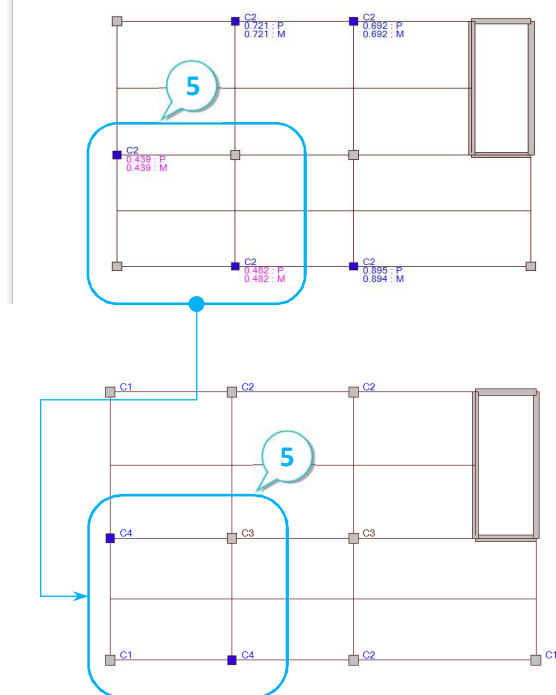
The ratio is helpful when finding members in a group whose design results are significantly different and assigning them to a different group name.

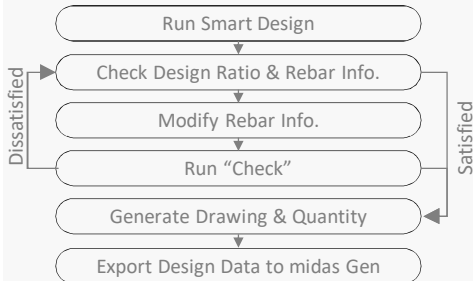
5. Select members with results smaller than the ratio and assign them to another group. Conversely, the members with results greater than the ratio can be assigned to another Group.

6. Repeat 1 to 5 to perform a detailed grouping task.



Material			Section		Main Bar						Hoop Bar						
Fcd (MPa)	Fy (MPa)	Fys (MPa)	3	Width (mm)	Height (mm)	Splice	No.	Rows	Name	Cc (mm)	Corner		End		Middle		
											Use	Name	User	Name	Space (mm)	Name	Space (mm)
30	500	400	Rectangle	400.00	400.00	0%	4	2	P25	63.50	<input type="checkbox"/>		<input checked="" type="checkbox"/>	P10	150.00	P10	300.00
30	500	400	Rectangle	400.00	400.00	0%	4	2	P25	63.50	<input type="checkbox"/>		<input checked="" type="checkbox"/>	P10	150.00	P10	300.00
30	500	400	Rectangle	400.00	400.00	0%	4	2	P25	63.50	<input type="checkbox"/>		<input checked="" type="checkbox"/>	P10	150.00	P10	300.00
30	500	400	Rectangle	400.00	400.00	0%	4	2	P25	63.50	<input type="checkbox"/>		<input checked="" type="checkbox"/>	P10	150.00	P10	300.00



**The sequence of detailed design**

1. Run "Smart Design".
2. Check the design result & rebar info.
3. Modify the rebar info.
4. Click "Check"
5. Repeat 2~4 until the design is satisfied.
6. Click "Drawing" Tap to generate the column list drawing.
7. Click "Create" button after selecting "RC"- "Batch Column".
8. Check whether the list has been created according to the story group.
9. Click "Quantity" Tap to generate the column quantity table.
10. Click "Create" button after selecting "RC"- "Batch Column".



**TIP**  
If the cross-section and rebar information are the same, the story name can be output integrated. For example, if C1 has the same section and rebar applied to all stories, the drawing is output as one list with names from 4~1C1.



**TIP**  
When reviewing the optimal structural system, batch column design allows a quick design and a quick quantity review.

Section Group: Assign Add Delete Clear Unused Auto Grouping \* Blue Text : Section group contains different input data

Story	Section Group	Story Group	Material			Shape	Width (mm)	Height (mm)	Splice	No.	Rows	Name	Cc (mm)	Corner	
			Fck (MPa)	Fy (MPa)	Fys (MPa)									Use	Name
4F	C2		30	500	400	Rectangle	400.00	400.00	0%	14	5	P20	63.50		
3F	C2		30	500	400	Rectangle	400.00	400.00	0%	14	5	P20	63.50		
2F	C2		30	500	400	Rectangle	400.00	400.00	0%	6	3	P20	63.50		
1F	C2		30	500	400	Rectangle	400.00	400.00	0%	6	3	P20	63.50		

Smart Design Check(F5) Report ... Apply(F3) Excel Auto Resize

Section Group: Assign Add Delete Clear Unused Auto Grouping \* Blue Text : Section group contains different input data

Story	Section Group	Story Group	Material			Shape	Width (mm)	Height (mm)	Splice	No.	Rows	Name	Cc (mm)	Corner	
			Fck (MPa)	Fy (MPa)	Fys (MPa)									Use	Name
4F	C2		30	500	400	Rectangle	400.00	400.00	0%	12	4	P20	63.50		
3F	C2		30	500	400	Rectangle	400.00	400.00	0%	12	4	P20	63.50		
2F	C2		30	500	400	Rectangle	400.00	400.00	0%	12	4	P20	63.50		
1F	C2		30	500	400	Rectangle	400.00	400.00	0%	12	4	P20	63.50		

Smart Design Check(F5) Report ... Apply(F3) Excel Auto Resize

Start Page Member Member List Drawing Quantity

Frame ByLayer BYLAYER

**MIDASIT** <http://www.midasuser.com>

**RC COLUMN LIST**

NAME	SECTION	NAME	SECTION
4-3C1	(400 x 400) MAIN BAR-1: 6-P20 MAIN BAR-2: - HOOP ( MID ): P10@120 HOOP ( END ): P10@60.00 TIE BAR: -	2-1C1	(400 x 400) MAIN BAR-1: 6-P20 MAIN BAR-2: - HOOP ( MID ): P10@120 HOOP ( END ): P10@60.00 TIE BAR: -
4-3C2	(400 x 400) MAIN BAR-1: 12-P20 MAIN BAR-2: - MAIN BAR-3: - HOOP ( MID ): P10@120 HOOP ( END ): P10@60.00 TIE BAR: 2-P10	2-1C2	(400 x 400) MAIN BAR-1: 10-P20 MAIN BAR-2: - MAIN BAR-3: - HOOP ( MID ): P10@120 HOOP ( END ): P10@60.00 TIE BAR: 1-P10

RC Batch Column Create Save As... Print List

Start Page Member Member List Drawing Quantity

Name	Height (m)	Size (mm)	Section				Quantity per Unit Length									
			Main				Hoop		Concrete				Form			
			Layer 1	Layer 2	Layer 3	Layer 4	END (mm)	MIDDLE (mm)	Concrete (mm³)	Form (mm²)	Main (kN)	Hoop (kN)	Sum (kN)	Total (kN)		
1C3(1Column(6))	3	400x400	8-P20	-	-	-	P10@60.00	P10@120	0.480	4.800	0.580	0.367	0.183	1.711	1.711	
1C3(1Column(7))	3	400x400	8-P20	-	-	-	P10@60.00	P10@120	0.480	4.800	0.580	0.367	0.183	1.711	1.711	
									0.960	9.600	1.161	0.733	0.367	3.422	3.422	
1C4(1Column(2))	3	400x400	8-P20	-	-	-	P10@60.00	P10@120	0.480	4.800	0.580	0.367	0.183	1.711	1.711	
1C4(1Column(3))	3	400x400	8-P20	-	-	-	P10@60.00	P10@120	0.480	4.800	0.580	0.367	0.183	1.711	1.711	
									0.960	9.600	1.161	0.733	0.367	3.422	3.422	
C1									5.760	57.60	6.094	4.400	2.200	18.79	18.79	
C2									5.760	57.60	9.577	4.400	2.200	25.75	25.75	
C3									3.840	38.40	4.063	2.933	1.467	12.53	12.53	
C4									3.840	38.40	4.063	2.933	1.467	12.53	12.53	
4F									4.800	48.00	5.659	3.667	1.833	16.82	16.82	
3F									4.800	48.00	5.659	3.667	1.833	16.82	16.82	
2F									4.800	48.00	6.239	3.667	1.833	17.98	17.98	
1F									4.800	48.00	6.239	3.667	1.833	17.98	17.98	

RC Batch Column Create Export to Excel ... Auto Resize

1. Click "Export".

2. Check on the target stories and groups.

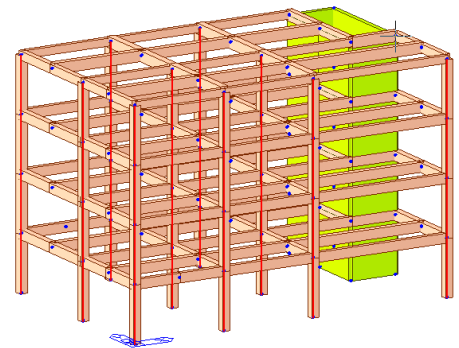
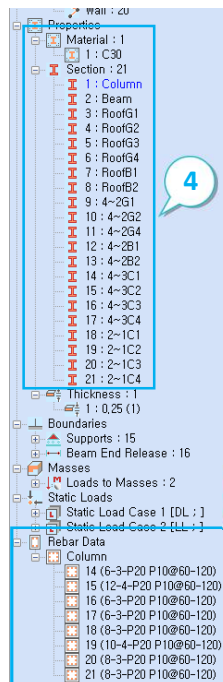
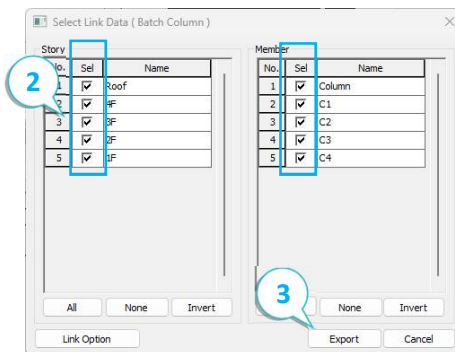
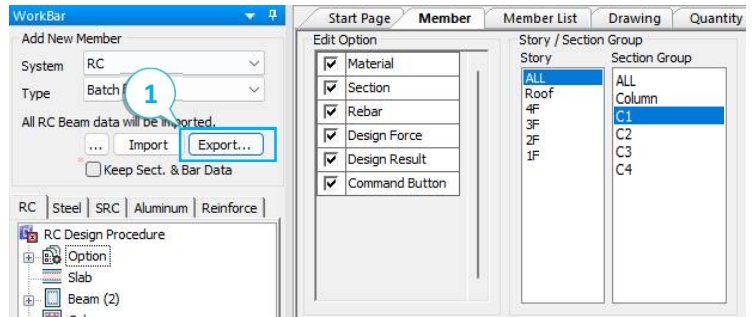
3. Click "Export".

4. Check the uploaded materials, sections, and rebar information.



**TIP**  
When the cross-section and material are modified, the member forces will be changed due to the model's stiffness changes. So the design results must be checked again through re-analysis and re-design (Code Check).

Alternatively, batch column design can be used to re-design and upgrade design data again.



# Solution for Structural Member Design with Drawing & Report



midas **Design<sup>+</sup>** 2024 (v1.1)  
for Batch Beam & Column Design