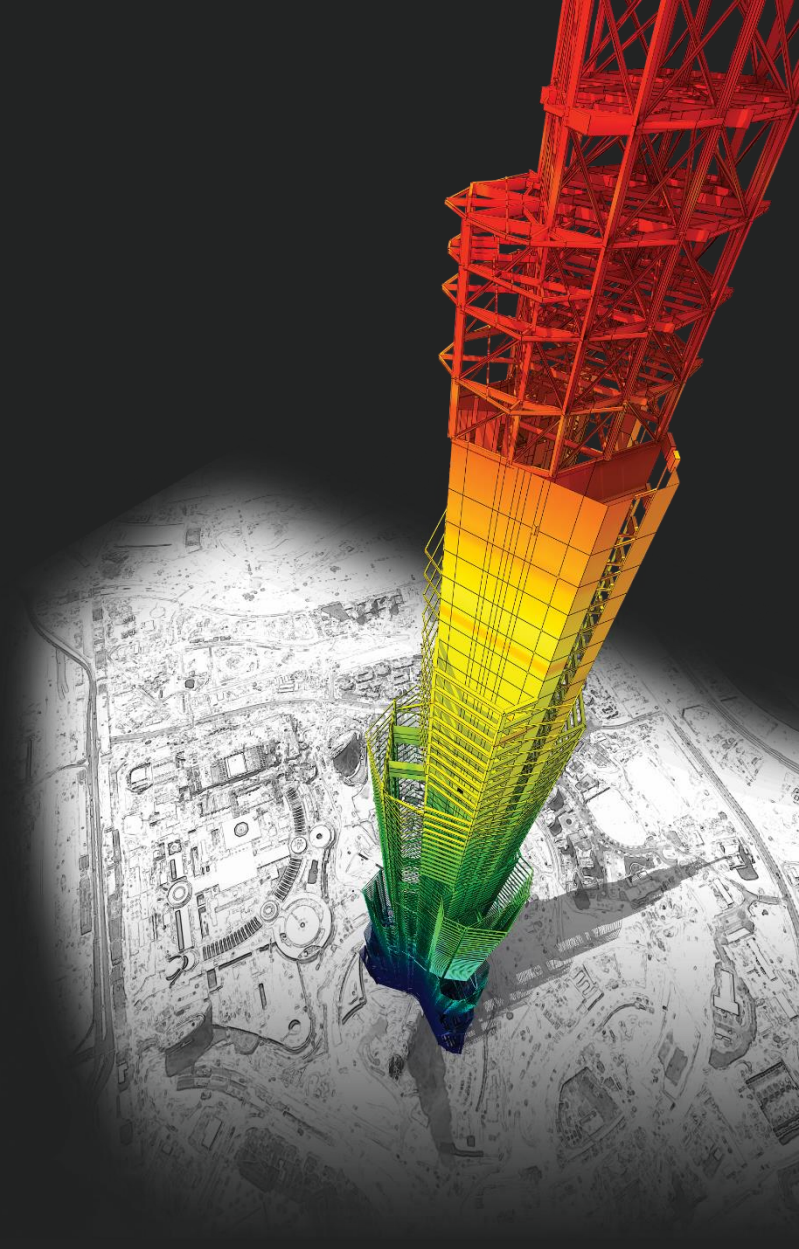
Release Note

Release Date : May. 2022

Product Ver. : midas Gen 2022 (v2.1) and Design+2022(v1.2)



DESIGN OF General Structures

Integrated Design System for Building and General Structures

Enhancements

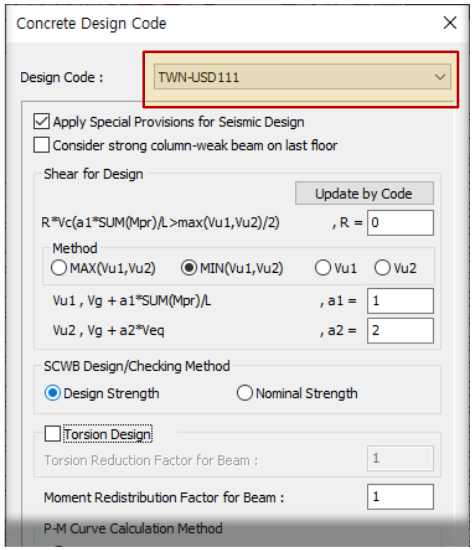
- *midas Gen*

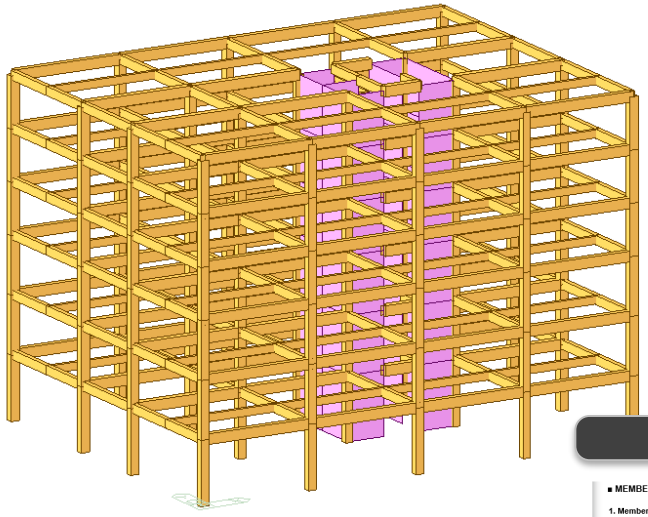
midas Gen

1.New Taiwanese RC Code : TWN-USD111

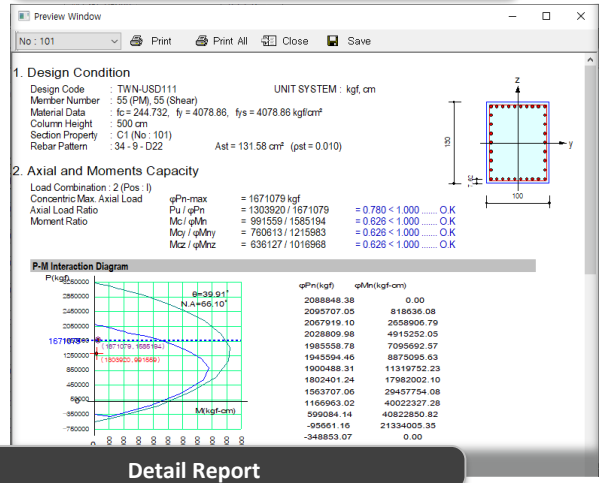
Added TWN-USD111 Code for RC Design

Concrete Design Code

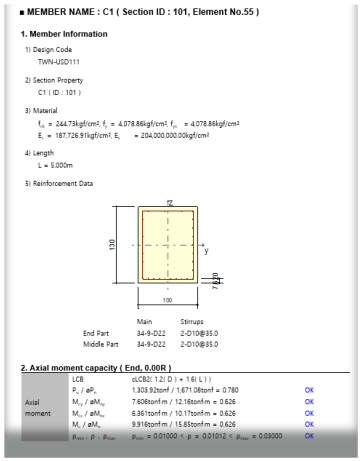


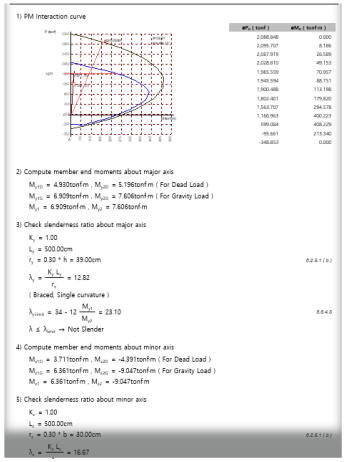


Graphic Report



Detail Report





Design Result Table

TWN-USD111 RC-Column Design Result Dialog

Code : TWN-USD111 Unit : kgf , cm

Sorted by: Member / Property

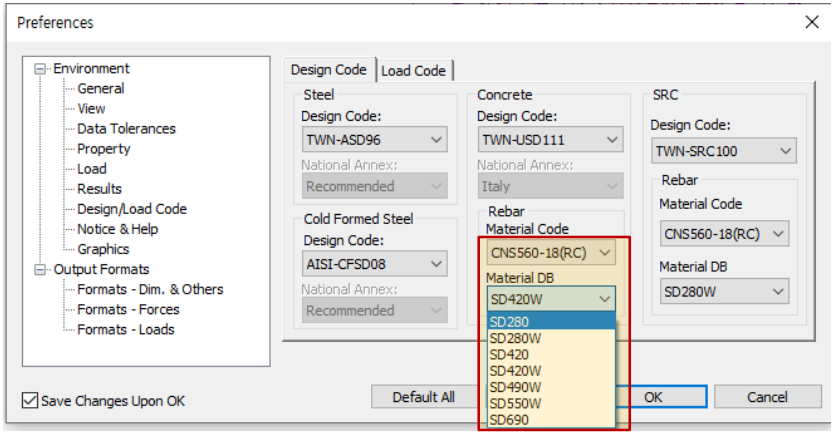
Primary Sorting Option: SECT / MEMB

MEMB	SEL	Section		fc	fy	LCB	Pu	Mc	Ast	V-Rebar	LCB	Vu.end	Rat-V.end	As-H.end	H-Rebar.end
SECT		Bc	Hc	Height	fys		Rat-P	Rat-M				Vu.mid	Rat-V.mid	As-H.mid	H-Rebar.mid
0		C1		244.732	4078.86	2	1303920	991559	131.58	34-9-D22	44	12895.4	0.102	0.0000	2-D10 @350
101		100.0	130.0	500.00	4078.86		0.780	0.626			44	12895.4	0.102	0.0000	2-D10 @350
0		C1		244.732	4078.86	2	1163569	2640129	123.84	32-10-D22	43	25098.9	0.282	0.0000	2-D10 @350
102		100.0	120.0	450.00	4078.86		0.752	0.619			43	25098.9	0.280	0.0000	2-D10 @350
0		C1		244.732	4078.86	2	916370	1145891	100.62	26-8-D22	59	21040.9	0.226	0.0000	2-D10 @350
103		100.0	100.0	400.00	2800.00		0.714	0.579			59	21040.9	0.225	0.0000	2-D10 @350
0		C1		420.000	4200.00	2	704123	1221249	85.140	22-8-D22	59	21265.7	0.303	0.0000	2-D10 @350

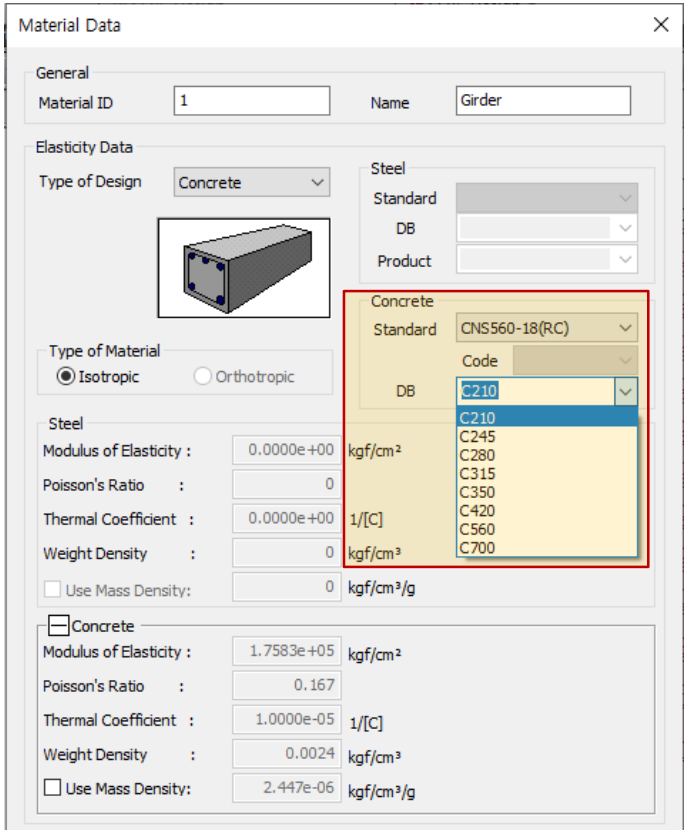
1.New Taiwanese RC Code : TWN-USD111

Added Concrete/Rebar DB and Material as per CNS560-18

Set Rebar Material



Concrete Material DB



Rebar strength as per CNS560-18

	Yield Strength Fy (kgf/cm^2)
SD280	2,800
SD280W	2,800
SD420	4,200
SD420W	4,200
SD490W	5,000
SD550W	5,600
SD690	7,000

1.New Taiwanese RC Code : TWN-USD111

Added TWN-USD111 Load Combinations

For Concrete Design

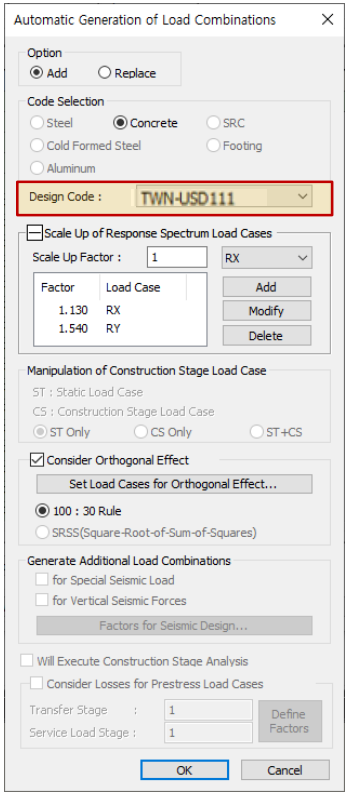
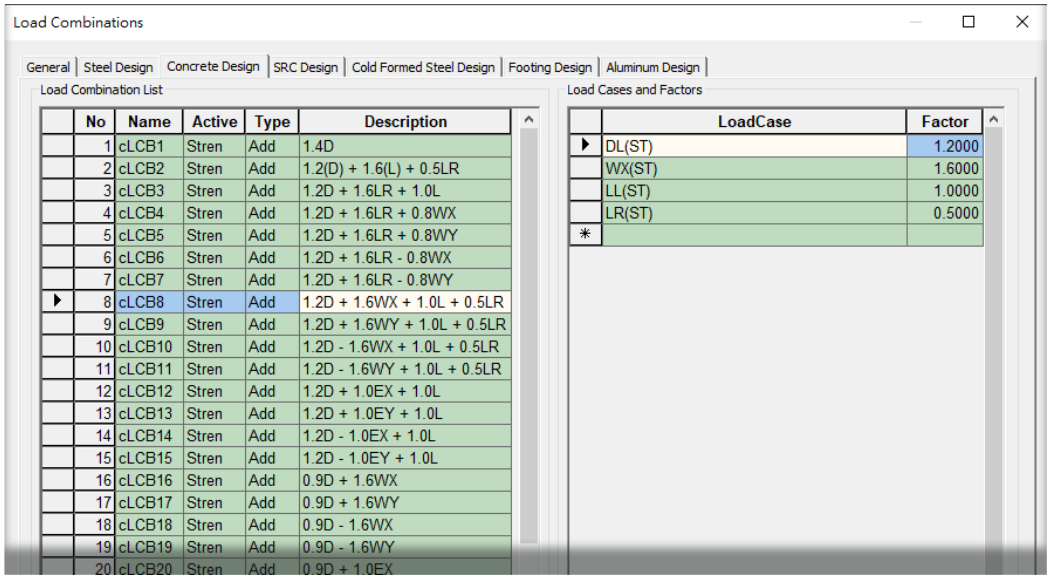


Table 5.3.1 Load Combinations

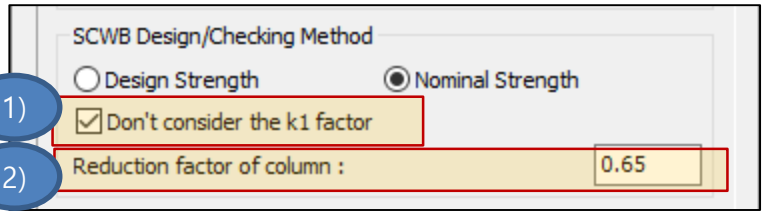
Provision	Load factors and combinations	Remark
Strength Load Combinations	1.4 D	• D : Dead load • L : Live load • Lr : Roof live load • S : Snow load • R : Rain load • W : Wind load • E : Earthquake load
	1.2D+1.6L + 0.5(Lr or S or R)	
	1.2D +1.6(Lr or S or R) + (1.0L or 0.8W)	
	1.2D ± 1.6W + 1.0L +0.5(Lr or S or R)	
	1.2D ± 1.0E + 1.0L +0.2S	
	0.9D ± 1.6W	
	0.9D ± 1.0E	



1.New Taiwanese RC Code : TWN-USD111

Design > RC Design Code > TWN-USD111 ,When Apply Special Provision for Seismic Design checked

SCWB Design/Checking Method



✓ Use Tips

Add options for SCWB Design /Checking method

1) *Can ignore the k1 factor. In this case k1 is considered as 1.0*
2) *Define the reduction factor of column, Φc factor. If 'Nominal Strength' is selected, reduction factor will be used*

✓ Reference Code

[Design Strength Method]

1)

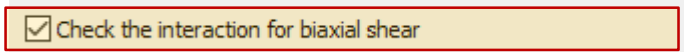
$$M_{c,T} = \left(\frac{6}{5}\right)\left(\emptyset_b M_{nb,L} + \emptyset_b M_{nb,R}\right) * k1 * \left(\frac{M_{ce,T}}{M_{ce,T}+M_{ce,B}}\right)$$

[Nominal Strength Method]

$$M_{c,T} = \left(\frac{6}{5}\right)\left(M_{nb,L} + M_{nb,R}\right) * k1 * \left(\frac{M_{ce,T}}{M_{ce,T}+M_{ce,B}}\right) * \emptyset_c$$

1) 2)

Check the interaction for biaxial shear



✓ Use Tips

Added options for Biaxial Shear Strength for columns

The interaction of one-way shear forces acting along the orthogonal axes needs to be considered as per TWN-USD111 (same as ACI 318-19). The provision 22.5.1.11 states that : "if shear ratio is more than 0.5 by each directions, Eq.(22.5.1.11)shall be satisfied."

Biaxial shear strength was not considered in the previous code.
Added an option to check the interaction of shear force ratio.

✓ Reference Code

From TWN-USD111

22.5.1.11 若 $\frac{V_{u,x}}{\phi V_{n,x}} > 0.5$ 且 $\frac{V_{u,y}}{\phi V_{n,y}} > 0.5$ ，則應符合式 (22.5.1.11)。

$$\frac{V_{u,x}}{\phi V_{n,x}} + \frac{V_{u,y}}{\phi V_{n,y}} \le 1.5 \qquad (22.5.1.11)$$

From ACI318-19

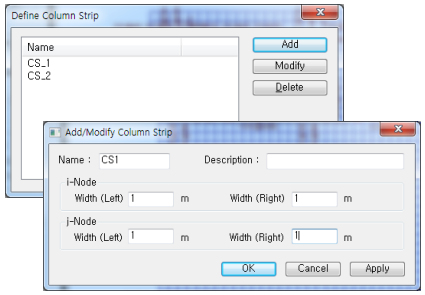
22.5.1.11 If $\frac{v_{u,x}}{\phi v_{n,x}} > 0.5$ and $\frac{v_{u,y}}{\phi v_{n,y}} > 0.5$ then Eq. (22.5.1.11) shall be satisfied.

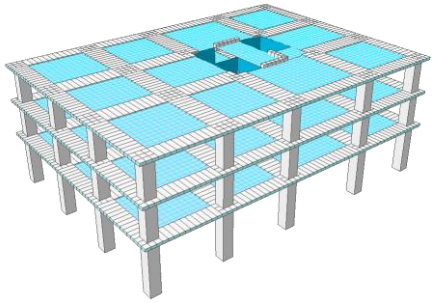
$$\frac{v_{u,x}}{\phi v_{n,x}} + \frac{v_{u,y}}{\phi v_{n,y}} \le 1.5 \qquad (22.5.1.11)$$

2. Column Strip Design & Checking : KDS 41 30 : 2018 (Korean Code)

Produce the Column Strip Design / Checking results considering the unbalanced moment as per KDS

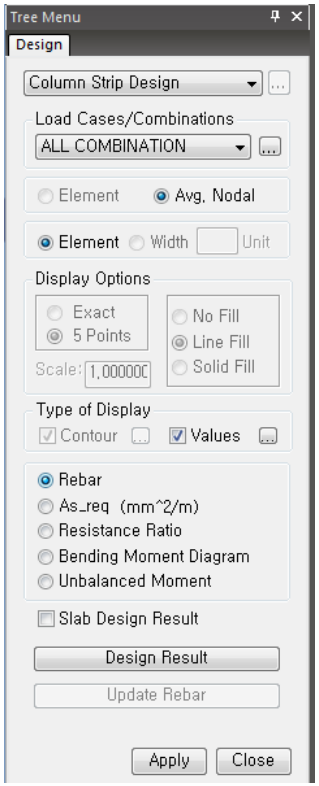
Define Column Strip



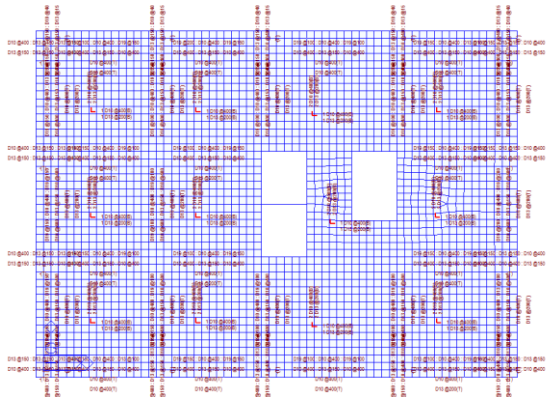


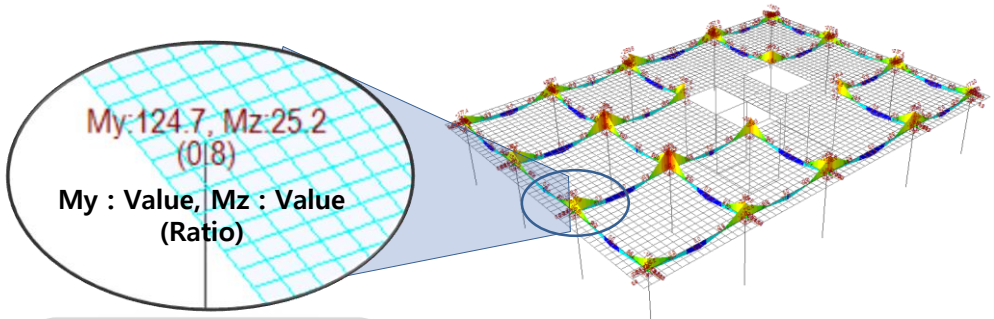
Check the defined strip area

Column Strip Design



Rebar design result





Strength ratio to unbalance moment by KDS code

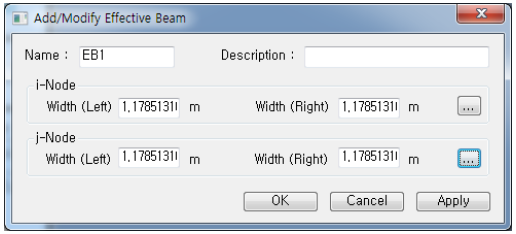
Strip Design Force

Accurate and quick design results can be secured through strip design considering the unbalance moment.

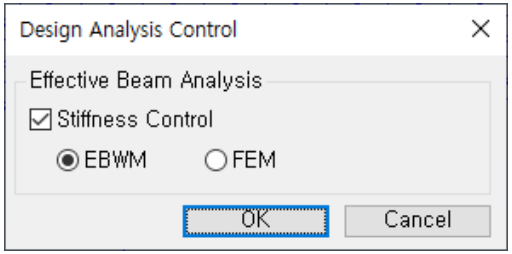
2. Column Strip Design & Checking : KDS 41 30 : 2018 (Korean Code)

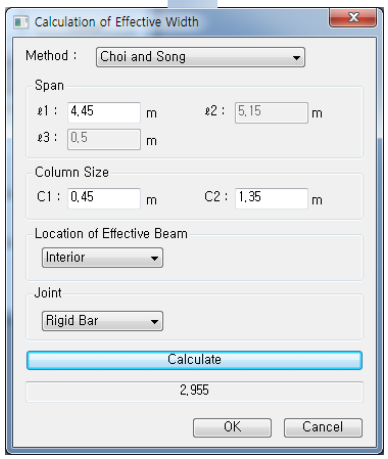
Supports automatic calculation of effective beam width method by Grossman's and Choi & Song's formula.

Add/Modify Effective Beam Width

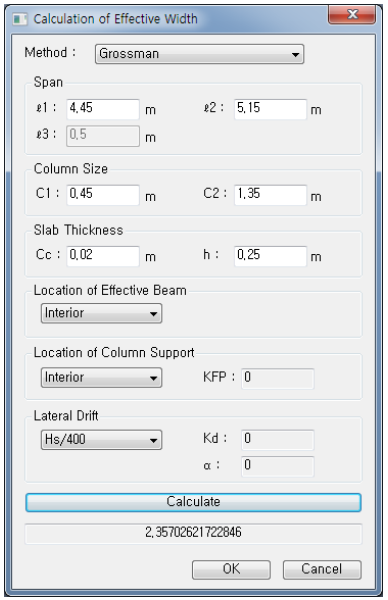


Design Analysis Control



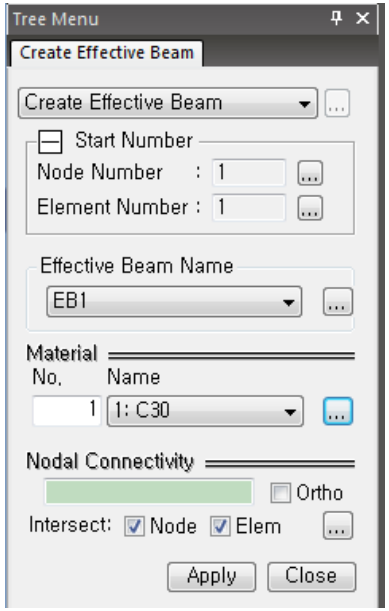


Choi and Song's Formula



Grossman's Formula

Create Effective Beam



Quick & efficient workflow with automatic calculation of effective beam widths.

Other major improvements and bug fixes are as follows.

Thank you very much for your interest and participation in program improvement.

[midas Gen 2022 v2.1] Fixes and Improvements

- [RS Design spectrum] DPT.1301/1302-61 enabled regardless of this country code option
- [SCWB Design/Checking Method] Improvement of design strength method calculation method of ACI series
- [Wall Design Result] NTC2018>Wall : Improved so that wall ID + Story / Wall ID (WID) outputs the same Asw-H result
- [RC Two way shear] Improved to find the punching shear parameter by adjusting the tolerance at the intersection with the element side
- [RC Beam Design] Correction of beam design calculation of compression rebar according to the position of the neutral axis
- [midas GSD] Modified so that the load combination of the linked Gen is loaded the same from GSD
- [RC column] Correction of As_H requirement(Horizontal reinforcement) of column according to unit conversion in graphic report
- [EC3 Cold Formed Design] For cross-sections that are symmetrical about the y - y axis, apply the Ncr calculation formula according to Eq.6.35