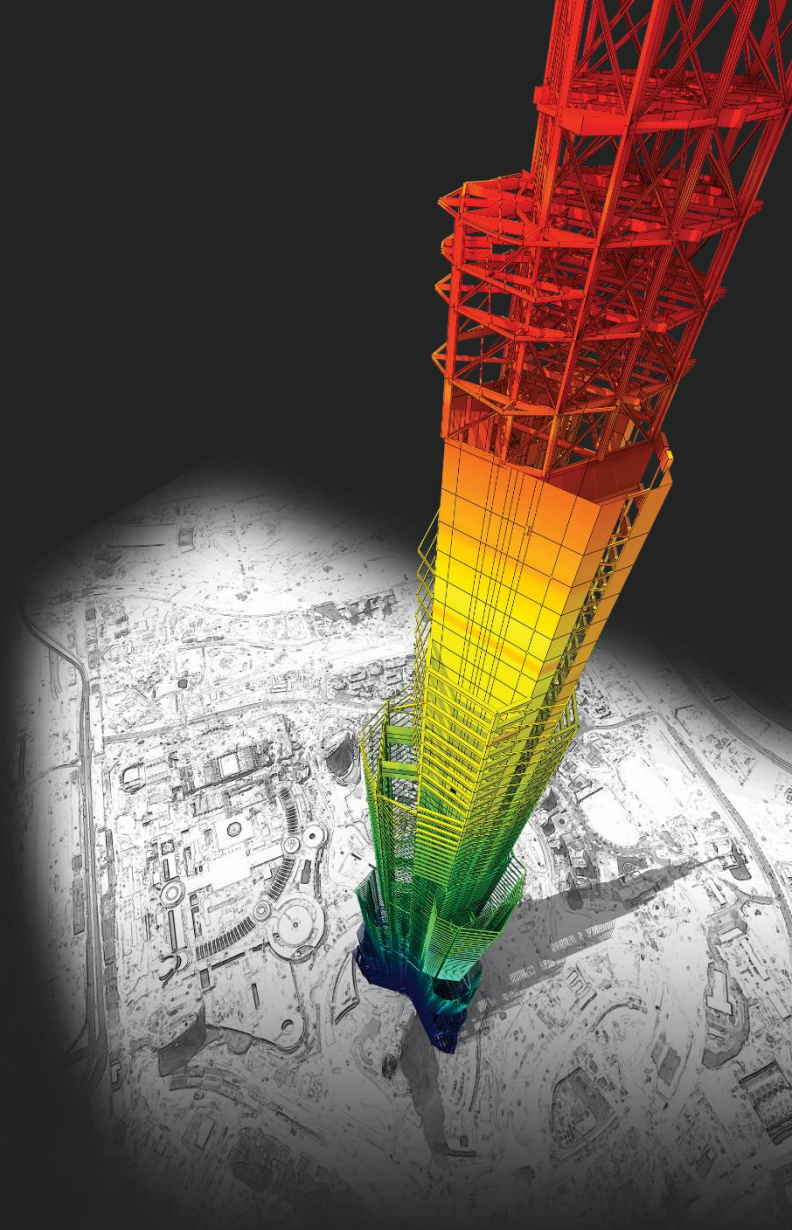


# Release Note

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Release Date : Mar. 2022

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



*DESIGN OF General Structures*

*Integrated Design System for Building and General Structures*

# Enhancements

- *midas Gen*

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↓ Go to **FREE TRIAL**

↓ **INSTALLER** DOWNLOAD

*midas* **Gen**

# 1. New American RC Code : ACI318-19 (US.SI)

## Add ACI318-19(US)/ACI318M-19(SI) Code for RC Design

### Concrete Design Code

Concrete Design Code

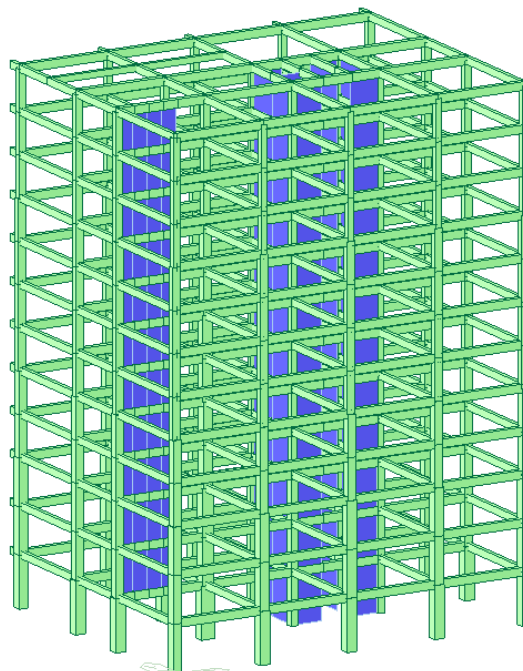
Design Code : **ACI318-19**  
**ACI318M-19**

☒ Check Beam Deflection  
☒ Apply Special Provisions for Seismic Design

☐ Seismic Design Parameter  
 Select Frame Type  
☒ Special Moment Frames  
☐ Intermediate Moment Frames  
☐ Ordinary Moment Frames

☒ Consider strong column-weak beam on last floor  
 Shear Wall Type  
☒ Special RC Structural Wall  
 Boundary Element Method  
☒ Displacement Based Method  
 Deflection Amplification Factor (Cd) **4.50**  
 Important Factor (Ie) **1.20**  
☐ Stress Based Method

Shear for Design Update by Code



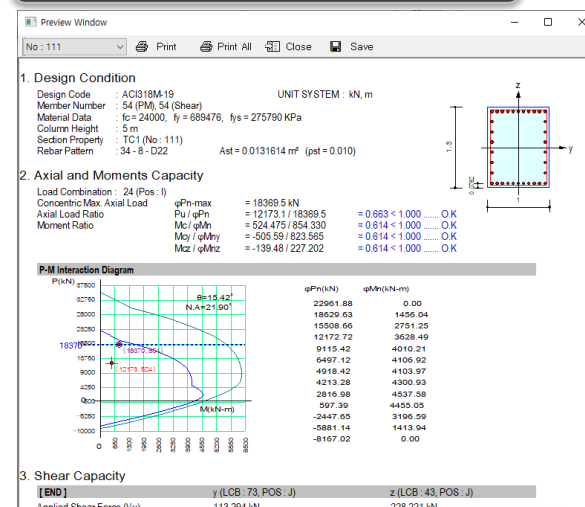
### Design Result Table

ACI318M-19 RC-Column Design Result Dialog

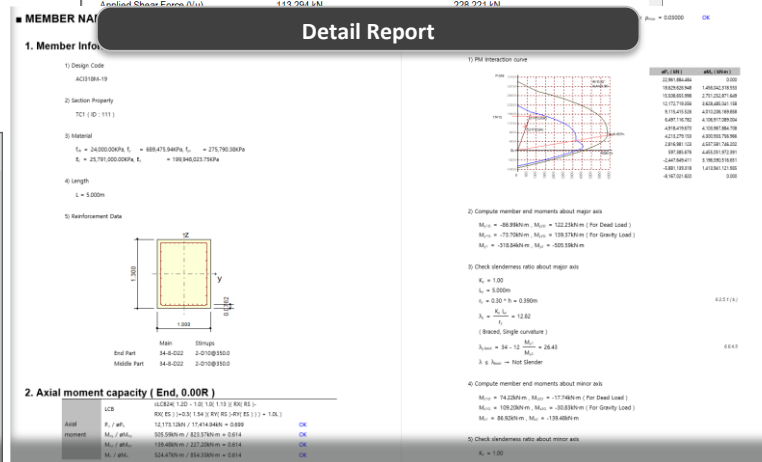
Code : **ACI318M-19** Unit : kN , m Primary Sorting Option  
 Sorted by ☐ Member ☒ Property

MEMB	SECT	SEL	Section	fc	fy	LCB	Pu	Mc	Ast	V-Rebar	LCB	Vu.end	Rat-V.end	As-H.end	H-Rebar.end
			Bc Hc	Height	fys		Rat-P	Rat-M				Vu.mid	Rat-V.mid	As-H.mid	H-Rebar.mid
0			C1	24000.0	689476	2	6783.16	134.361	0.0085	22-8-D22	59	218.357	0.306	0.0000	2-D10 @140
104			0.800 1.000	4.0000	275790		0.626	0.538			59	218.357	0.305	0.0000	2-D10 @140
0			C1	24000.0	689476	2	4784.04	156.064	0.0070	18-6-D22	23	219.233	0.354	0.0000	2-D10 @140
105			0.800 0.800	4.0000	275790		0.549	0.500			23	219.233	0.352	0.0000	2-D10 @140
0			C1	24000.0	689476	28	959.745	544.436	0.0054	14-5-D22	11	197.537	0.593	0.0008	2-D10 @180
106			0.600 0.600	4.0000	275790		0.993	0.998			11	197.537	0.589	0.0008	2-D10 @180
0			TC1	24000.0	689476	24	12173.1	524.475	0.0132	34-8-D22	43	228.221	0.252	0.0000	2-D10 @350

### Graphic Report



### Detail Report



# 1. New American RC Code : ACI318-19 (US.SI)

## Add ACI318-19 Load combinations

### For Concrete Design

Automatic Generation of Load Combinations

Option  
☒ Add ☐ Replace ☒ Add Envelope

Code Selection  
☐ Steel ☒ Concrete ☐ SRC  
☐ Cold Formed Steel ☐ Footing  
☐ Aluminum

Design Code : ACI318-19

Scale Up of Response Spectrum Load Cases  
 Scale Up Factor : 1 RX  

Factor	Load Case
1.130	RX
1.540	RY

 Add Modify Delete

Wind Load Factor  
☒ Strength-level ☐ Service-level

☐ Consider Lateral Soil Pressure Factor  
 Load Factor : 0.9

Manipulation of Construction Stage Load Case  
 ST : Static Load Case  
 CS : Construction Stage Load Case  
☒ ST Only ☐ CS Only ☐ ST+CS

☒ Consider Orthogonal Effect  
 Set Load Cases for Orthogonal Effect...  
☒ 100 : 30 Rule  
☐ SRSS(Square-Root-of-Sum-of-Squares)

Generate Additional Load Combinations  
☒ for Special Seismic Load  
☒ for Vertical Seismic Forces  
 Factors for Seismic Design...

☐ Will Execute Construction Stage Analysis  
☐ Consider Losses for Prestress Load Cases

Transfer Stage : 1 Define Factors  
 Service Load Stage : 1

OK Cancel

Provision	Load factors and combinations	Remark
Strength Load Combinations	1.4 (D+F)	<ul style="list-style-type: none"> <li>D : Dead Load</li> <li>F : Fluid Load</li> <li>T : Temperature Load</li> <li>H : Lateral pressure load of soil and water in soil</li> <li>L : Live load</li> <li>Lr : Roof live load</li> <li>R : Rain load</li> <li>W : Wind load</li> <li>E : Earthquake load (=E<sub>h</sub> + E<sub>v</sub>)</li> <li>Em : maximum effect of horizontal and vertical earthquake force (=Ω<sub>0</sub>E<sub>h</sub>)</li> <li>Ω<sub>0</sub> : Seismic force amplification factor</li> <li>E<sub>h</sub> : Horizontal earthquake load</li> <li>E<sub>v</sub> : Vertical earthquake load (not provided in Gen2 022 v1.1)</li> </ul>
	1.2(D+F+T) + 1.6(L+H) + 0.5(Lr or R)	
	1.2D + 1.6(Lr or R) + (1.0L or 0.5W)	
	1.2D ± 1.0W + 1.0L + 0.5(Lr or R)	
	1.2D ± 1.0E + 1.0L	
	0.9D ± 1.0W + 1.6H	
	0.9D ± 1.0E + 1.6H	
Allowable stress Load Combinations	D + F	
	D + H + F + L + T	
	D + H + F + (Lr or R)	
	D + H + F + 0.75[L+T(Lr or R)]	
	D + H + F ± (0.6W or E / 1.4)	
Special load combinations	1.2D + 1.0L + 1.0Em	
	0.9D ± 1.0Em	

# 1. New American RC Code : ACI318-19 (US.SI)

## Add New Rebar DB and material as per ASTM19

### Set Rebar Material

Preferences

Environment

- General
- View
- Data Tolerances
- Property
- Load
- Results
- Design/Load Code
- Notice & Help
- Graphics
- Output Formats
  - Formats - Dim. & Others
  - Formats - Forces
  - Formats - Loads

Design Code | Load Code

Steel

Design Code: AISC(15th)-LRFD16

National Annex: Recommended

Cold Formed Steel

Design Code: Eurocode3-1-3:06

National Annex: Recommended

Concrete

Design Code: ACI318-19

National Annex: Italy

Rebar

Material Code: ASTM19(RC)

Material DB: Grade 40

Grade 40

Grade 60

Grade 80

Grade 100

SR

Design Code: SSRC79

Rebar

Material Code: ASTM19(RC)

Material DB: Grade 40

OK Cancel

Save Changes Upon OK

Default All Set Default

### Rebar strength as per ASTM 19

	Tensile Strength	Yield Strength
	Fu (psi)	Fy (psi)
Grade 40	60,000	40,000
Grade 60	80,000	60,000
Grade 80	100,000	80,000
Grade 100	117,000	10,000

### Rebar DB as per ASTM19 & Design rebar setting

Rebar Information

Rebar Code: ASTM

CHK	Name	Dia (in)	Area (in²)	Dia(Out) (in)	Weight (kips/in)
<input type="checkbox"/>	#3	0.3750	0.1100	0.3750	0.0000
<input type="checkbox"/>	#4	0.5000	0.2000	0.5000	0.0001
<input type="checkbox"/>	#5	0.6250	0.3100	0.6250	0.0001
<input type="checkbox"/>	#6	0.7500	0.4400	0.7500	0.0001
<input type="checkbox"/>	#7	0.8750	0.6000	0.8750	0.0002
<input type="checkbox"/>	#8	1.0000	0.7900	1.0000	0.0002
<input type="checkbox"/>	#9	1.1280	1.0000	1.1280	0.0003
<input type="checkbox"/>	#10	1.2700	1.2700	1.2700	0.0004
<input type="checkbox"/>	#11	1.4100	1.5600	1.4100	0.0004
<input type="checkbox"/>	#14	1.6930	2.2500	1.6930	0.0006
<input type="checkbox"/>	#18	2.2570	4.0000	2.2570	0.0011

OK Close

## 2.New Taiwanese RC Code : TWN-USD111

### Add TWN-USD111 Code for RC Design

#### Concrete Design Code

Concrete Design Code

Design Code : **TWN-USD111**

☒ Apply Special Provisions for Seismic Design  
☐ Consider strong column-weak beam on last floor

Shear for Design Update by Code

$R^*V_c(a^1 \sum M_{pr})/L > \max(Vu1, Vu2)/2$  ,  $R = 0$

Method  
☐ MAX(Vu1, Vu2) ☒ MIN(Vu1, Vu2) ☐ Vu1 ☐ Vu2

$Vu1, Vg + a^1 \sum M_{pr}/L$  ,  $a^1 = 1$   
 $Vu2, Vg + a^2 \sum V_{eq}$  ,  $a^2 = 2$

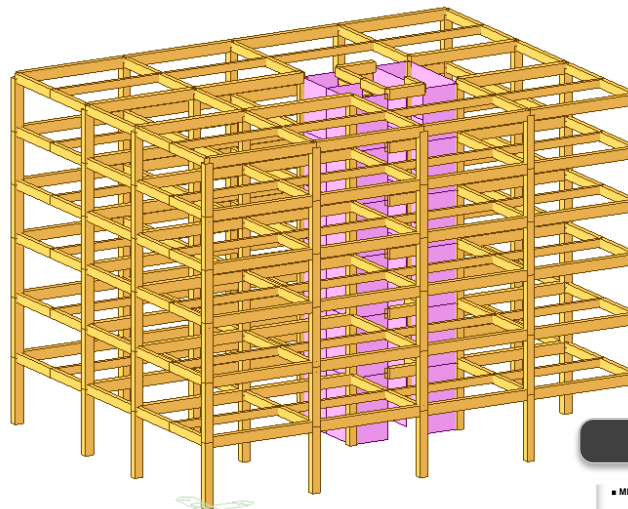
SCWB Design/Checking Method  
☒ Design Strength ☐ Nominal Strength

☒ Torsion Design

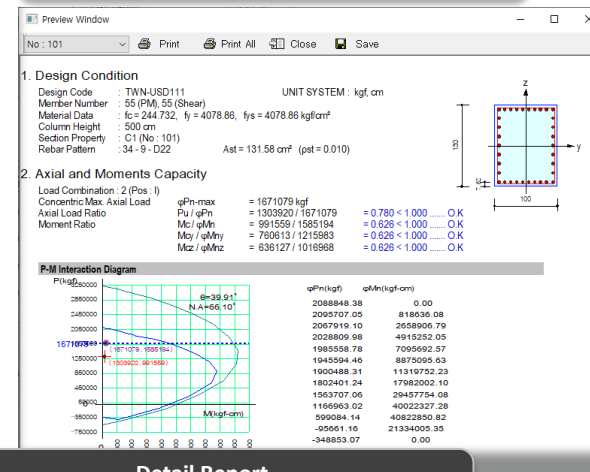
Torsion Reduction Factor for Beam :

Moment Redistribution Factor for Beam :

P-M Curve Calculation Method



#### Graphic Report



#### Design Result Table

TWN-USD111 RC-Column Design Result Dialog

Code : **TWN-USD111** Unit : kgf , cm Primary Sorting Option

Sorted by ☐ Member ☒ Property

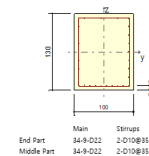
☐ SECT ☒ MEMB

MEMB	SECT	Section	fc	fy	L	Pu	Mc	As	V-Rebar	LCB	Vu.end	Rat-V.end	As-H.end	H-Rebar.end
SECT		Bc Hc	Height	fys	LCB	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

#### MEMBER NAME : C1 ( Section ID : 101, Element No.55 )

##### 1. Member Information

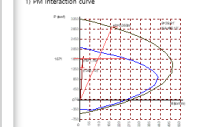
- Design Code : TWN-USD111
- Section Property : C1 ( ID : 101 )
- Material :  $f_c = 244.732$  kgf/cm<sup>2</sup>,  $f_y = 4078.86$  kgf/cm<sup>2</sup>,  $E = 187126.919$  kgf/cm<sup>2</sup>,  $E_s = 204000.000$  kgf/cm<sup>2</sup>
- Length :  $L = 500$  mm
- Reinforcement Data



##### 2. Axial moment capacity ( End, 0.00R )

LCB	gCBZ (2.0 ( 1 + 1.6 ( L ) )	Pu / qPu	Mc / qMc	As / qAs	Vs / qVs
End Part	34-9-D22	2-010855.0	1303.920 / 1671.080 = 0.780	OK	OK
Middle Part	34-9-D22	2-010855.0	7808.13 / 12158.83 = 0.628	OK	OK
			6381.27 / 10189.68 = 0.628	OK	OK
			9.91559 / 15.85194 = 0.628	OK	OK
			0.01000 < 0.01012 < 0.01000	OK	OK

##### 1) P-M Interaction curve



##### 2) Compute member end moments about major axis

$M_{u1} = 4.930$  ton-m,  $M_{u2} = 1.186$  ton-m ( For Dead Load )  
 $M_{u1} = 6.920$  ton-m,  $M_{u2} = 7.606$  ton-m ( For Gravity Load )  
 $M_{u1} = 6.920$  ton-m,  $M_{u2} = 7.606$  ton-m

##### 3) Check slenderness ratio about major axis

$K_u = 1.00$   
 $L_u = 500.00$  mm  
 $r_u = 5.21 \times 10 = 52.10$  mm  
 $\lambda_u = \frac{L_u}{r_u} = 12.81$   
 ( Braced Single curvature )  
 $\lambda_{u1} = 34 - 12 = 22$   
 $\lambda_u \leq \lambda_{u1} \rightarrow$  Not Slender

##### 4) Compute member end moments about minor axis

$M_{u1} = 3.717$  ton-m,  $M_{u2} = 4.231$  ton-m ( For Dead Load )  
 $M_{u1} = 6.381$  ton-m,  $M_{u2} = 9.047$  ton-m ( For Gravity Load )  
 $M_{u1} = 6.381$  ton-m,  $M_{u2} = 9.047$  ton-m

##### 5) Check slenderness ratio about minor axis

$K_u = 1.00$   
 $L_u = 500.00$  mm  
 $r_u = 5.21 \times 10 = 52.10$  mm  
 $\lambda_u = \frac{L_u}{r_u} = 15.67$

## 2.New Taiwanese RC Code : TWN-USD111

### Add TWN-USD111 Load combinations

For Concrete Design

Automatic Generation of Load Combinations

Option  
☒ Add ☐ Replace

Code Selection  
☐ Steel ☒ Concrete ☐ SRC  
☐ Cold Formed Steel ☐ Footing  
☐ Aluminum

Design Code : TWN-USD 100

☐ Scale Up of Response Spectrum Load Cases  
 Scale Up Factor : 1 RX

Factor	Load Case
1.130	RX
1.540	RY

Add Modify Delete

Manipulation of Construction Stage Load Case  
 ST : Static Load Case  
 CS : Construction Stage Load Case  
☒ ST Only ☐ CS Only ☐ ST+CS

☒ Consider Orthogonal Effect  
 Set Load Cases for Orthogonal Effect...  
☒ 100 : 30 Rule  
☐ SRSS(Square-Root-of-Sum-of-Squares)

Generate Additional Load Combinations  
☐ for Special Seismic Load  
☐ for Vertical Seismic Forces  
 Factors for Seismic Design...

☐ Will Execute Construction Stage Analysis  
☐ Consider Losses for Prestress Load Cases  
 Transfer Stage : 1 Define Factors  
 Service Load Stage : 1

OK Cancel

Table 5.3.1 Load Combinations

Provision	Load factors and combinations	Remark
Strength Load Combinations	1.4 D	<ul style="list-style-type: none"> <li>D : Dead load</li> <li>L : Live load</li> <li>Lr : Roof live load</li> <li>S : Snow load</li> <li>R : Rain load</li> <li>W : Wind load</li> <li>E : Earthquake load</li> </ul>
	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	



## 2.New Taiwanese RC Code : TWN-USD111

**Add Concrete/Rebar DB and material as per CNS560-18**

### Set Rebar Material

Preferences

Environment

- General
- View
- Data Tolerances
- Property
- Load
- Results
- Design/Load Code
- Notice & Help
- Graphics
- Output Formats
  - Formats - Dim. & Others
  - Formats - Forces
  - Formats - Loads

Design Code | Load Code

Steel

Design Code: TWN-ASD96

National Annex: Recommended

Cold Formed Steel

Design Code: AISI-CFSD08

National Annex: Recommended

Concrete

Design Code: TWN-USD111

National Annex: Italy

Rebar

Material Code: CNS560-18(RC)

Material DB: SD280

SD280W

SD420

SD420W

SD490W

SD550W

SD690

OK

Cancel

Save Changes Upon OK

Default All

### Rebar strength as per CNS560-18

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

### Concrete Material DB

Material Data

General

Material ID: 1

Name: Girder

Elasticity Data

Type of Design: Concrete

Steel

Standard: DB

Product: DB

Type of Material

☒ Isotropic ☐ Orthotropic

Steel

Modulus of Elasticity: 0.0000e+00 kgf/cm<sup>2</sup>

Poisson's Ratio: 0

Thermal Coefficient: 0.0000e+00 1/[C]

Weight Density: 0 kgf/cm<sup>3</sup>

☐ Use Mass Density: 0 kgf/cm<sup>3</sup>/g

Concrete

Modulus of Elasticity: 1.7583e+05 kgf/cm<sup>2</sup>

Poisson's Ratio: 0.167

Thermal Coefficient: 1.0000e-05 1/[C]

Weight Density: 0.0024 kgf/cm<sup>3</sup>

☐ Use Mass Density: 2.447e-06 kgf/cm<sup>3</sup>/g

Concrete

Standard: CNS560-18(RC)

Code: C210

DB: C210

C245

C280

C315

C350

C420

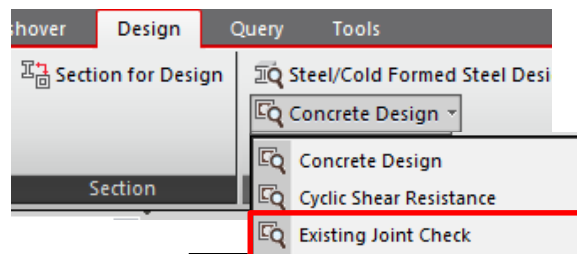
C560

C700

### 3. Beam-Column Joints check for Existing Building as per NTC2018

#### Beam-Column Joints Capacity check for existing building

- Design > result > Concrete Design > Existing Joint Check



#### Set Existing Joint Check Parameters

Set Existing Joint Check Parameters

Load Case/Combination  
ALL COMBINATION

Existing Joint Check Table Type  
☒ Show Selected Elements  
☐ Show All Elements

Select Check Position  
☒ Top  
☐ Bottom

OK Cancel

#### Result Table for Joint Capacity check for existing building

	Elem	Position	Stress	Beam-Column Joint Check for Existing Building							
				y-axis				z-axis			
				Load	Demand (N/mm²)	Capacity (N/mm²)	Remark	Load	Demand (N/mm²)	Capacity (N/mm²)	Remark
Check Position = Bottom											
Press right mouse button and click 'Set Existing Joint Check Parameters' menu to change Load Case/Combination/Select Check Position											
81	Bottom	Tensile	sism22	8.2225	1.5000	NG	sism22	5.0651	1.5000	NG	
81	Bottom	Compressive	sism22	8.2471	12.5000	OK	sism22	5.0942	12.5000	OK	

Demand : Joints Stress,  $\sigma_k$  and  $\sigma_{jc}$

Capacity : by Equation below

– per la resistenza a trazione:

**Tensile stress**

$$\sigma_{jt} = \left[ \frac{N}{2A_j} - \sqrt{\left( \frac{N}{2A_j} \right)^2 + \left( \frac{V_j}{A_j} \right)^2} \right] \leq 0.3\sqrt{f_c} (f_c \text{ in MPa}) \quad [\text{C8.7.2.11}]$$

– per la resistenza a compressione:

**Compressive stress**

$$\sigma_{jc} = \frac{N}{2A_j} + \sqrt{\left( \frac{N}{2A_j} \right)^2 + \left( \frac{V_j}{A_j} \right)^2} \leq 0.5f_c (f_c \text{ in MPa}) \quad [\text{C8.7.2.12}]$$

Demand ≤ Capacity → O.K

Demand > Capacity → N.G.

### 3. Beam-Column Joints check for Existing Building as per NTC2018

#### Beam-Column Joints check for existing building

- Design > result > Concrete Design > Existing Joint Check

Result Table for Beam-Column Joint check for Existing Building

	Elem	Position	Stress	Beam-Column Joint Check for Existing Building							
				y-axis				z-axis			
				Load	Demand (N/mm²)	Capacity (N/mm²)	Remark	Load	Demand (N/mm²)	Capacity (N/mm²)	Remark
	Check Position = Bottom										
	Press right mouse button and click 'Set Existing Joint Check Parameters' menu to change Load Case/Combination/Select Check Position										
▶	81	Bottom	Tensile	sism22	8.2225	1.5000	NG	sism22	5.0651	1.5000	NG
	81	Bottom	Compressive	sism22	8.2471	12.5000	OK	sism22	5.0942	12.5000	OK

#### Use Tips

- 1) This check option is activated only with NTC2018.
- 2) If 'Apply Special Provision for Seismic Design' of concrete design code is active, this check option can't be activated.
- 3) This check must be performed only for 'Not Confined Joint' as defined in § 7.4.4.3 of the NTC
- 4) This check is 'existing structure review', so it is calculated using the beam reinforcement information entered by the user.

#### Note

##### C8.7.2.3.5 Beam and Column for Existing Building as per CIRCOLARE NTC2018

- [Calculation & check of diagonal tensile stress for beam-column joint]

$$\sigma_{jt} = \left| \frac{N}{2A_j} - \sqrt{\left(\frac{N}{2A_j}\right)^2 + \left(\frac{V_j}{A_j}\right)^2} \right| \leq 0.3\sqrt{f_c} (f_c \text{ in MPa}) \quad [\text{C8.7.2.11}]$$

- [Calculation & check of diagonal compressive stress for beam-column joint]

$$\sigma_{jc} = \frac{N}{2A_j} + \sqrt{\left(\frac{N}{2A_j}\right)^2 + \left(\frac{V_j}{A_j}\right)^2} \leq 0.5f_c (f_c \text{ in MPa}) \quad [\text{C8.7.2.12}]$$

Where,

1)  $N$  : Axial force acting on the upper column  
(+ : compressive, - : tensile)

2)  $V_j$  : Total shear acting on the joint, obtained as a sum algebraic of the shear transmitted by the upper pillar and of the horizontal stresses transmitted by the upper parts of the beams

3)  $A_j$  :  $b_j * h_{jc}$   
where  $b_j$  and  $h_{jc}$  are defined in § 7.4.4.3.1 of the NTC

## 4. Crack Control Check for RC Column as per EC2:04 & NTC

### RC Column Crack Widths Check as per EC2:04 & NTC2018

#### Set Beam-Column Joint Design Parameter

☐ Seismic Design Parameter  
☒ Beam-Column Joint Design  
     Gamma<sub>rd</sub>   
☒ Confined Joint      ☒ Not Confined Joint  
 Select Check Position  
☒ Top      ☐ Bottom

#### Check the serviceability check

#### RC Column Check

Code : EC2:04,NTC2018

Unit : Nmm

Primary Sorting Option

Sorted by

☒ Member

☐ Property

Result

☐ Strength

☒ Serviceability

☐ Elastic

☐ SECT

☒ MEMB

MEMB	SEL	Section	fck	fyk	CHK	Stress Control						Crack Control									
						LCB	sig-cl	sig-cla	LCB	sig-cc	sig-cca	LCB	sig-s	sig-sa	LCB	w_y	wa_y	LCB	w_z	wa_z	
913		C1	24.0000	550.000																	
106	<input type="checkbox"/>	600.0	600.0	4000.0	420.000	NG#	101	11.7624	2.49610	101	15.8097	14.4000	101	113.438	440.000	97	0.0687	0.3000	80	0.3729	0.3000

#### Graphic Result

#### 4. Serviceability : Stress Limit Check

	Conc.(Tens.)	Conc.(Comp.)	Conc.(Comp.)(QP)	Rebar
Load Combination	101(F)	101(F)	97(Q)	101(F)
Stress(s)	-11.76	15.81	15.64	113.44
Allowable Stress(sa)	2.50	14.40	10.80	440.00
Stress Ratio(s/sa)	Cracked Section	Cracked Section	Cracked Section	Cracked Section
Check Linear Creep			Non-linear Creep	

#### 5. Serviceability : Crack Limit Check

When cracked section,

	y (LCB : 97, POS : J)	z (LCB : 80, POS : J)
Crack Width(w)	0.06870 mm	0.37293 mm
Allowable Crack Width(wa)	0.30000 mm	0.30000 mm
Check Ratio(w/wa)	0.229 < 1.000 ..... O.K	1.243 > 1.000 ..... N.G

#### Detail Result

```

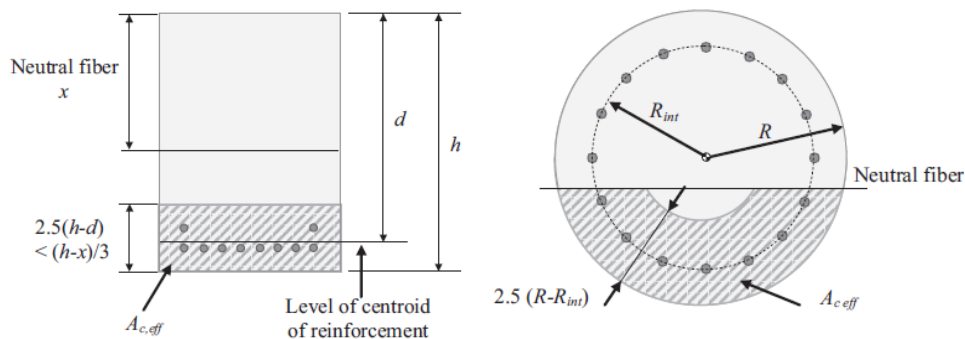
[[[*]]] CHECK SERVICEABILITY CRACK LIMIT ABOUT MAJOR AXIS.

( ). Calculate crack width.
[ EN 1992-1-1:2004 Clause 7.3.4 , Appendix B. ]
{ LCB = 97, POS = J }
- Pu = 816411.88 N.
- Muy = -191305395.40 N-mm.
- fcm = fck+8(MPa) = 32.00000 MPa.
- fctm = 0.30*fck^(2/3) = 2.49610 MPa. (fck≤C50/60)
- fct,eff = fctm (by 28 days).
- n = 12.82603
- σs = 64.662 MPa.
- kt = 0.6 (for short term loading.).
- X = 329.19948 mm.
- hc,eff = MIN[ 2.5*(h-d), (h-X)/3, h/2 ] = 90.26684 mm.
- Ac,eff = Bc*hc,eff = 54160.10376 mm2.
- ρp,eff = As/Ac,eff = 0.0214
- Ecm = 22[fcm/10]0.3+1000 = 31186.574 MPa. (by Table 3.1)
- αe = Es/Ecm = 6.41302
- (εsm-εcm) = (σs-kt*fct,eff/ρp,eff*(1+αe*ρp,eff))/Es
= -0.000074
- (εsm-εcm) = 0.6*σs/Es = 0.000194
- (εsm-εcm) = 0.6*σs/Es = 0.000194
- Bond coefficient(k1) = 0.8000
- Strain distribution coefficient(k2) = 0.5000
- NAD Value (k3) = 3.4000
- NAD Value (k4) = 0.4250
- c = 52.40000 mm.
- ϕ = 22.20000 mm.
- Sr,max = k3*c + k1*k2*k4*ϕ/ρp,eff = 354.16984 mm.
- wk = Sr,max * (εsm-εcm) = 0.06870 mm.
- wk < 0.300 mm. ----> O.K !
  
```

## 4. Crack Control Check for RC Column as per EC2:04 & NTC

### RC Column Crack Widths Check as per EC2:04 & NTC2018

Calculating effective area of concrete in tension , $A_{c,eff}$  ,in program  
[ Rectangular and Circular Column]



✓ Note

Calculate crack width using the following formular as per EC2:04 and NTC

$$Wk = S_{r,max} (\epsilon_{sm} - \epsilon_{cm}) \leq Wk_{max}$$

1. Determine  $\epsilon_{sm} - \epsilon_{cm}$

$$\epsilon_{sm} - \epsilon_{cm} = \frac{\sigma_s - k_t \frac{f_{ct,eff}}{\rho_{p,eff}} (1 + \alpha_e \rho_{p,eff})}{E_s} \geq 0.6 \frac{\sigma_s}{E_s}$$

2. Determine  $S_{r,max}$

$$S_{r,max} = k_3 c + \frac{k_1 k_2 k_4 \phi}{\rho_{p,eff}}$$

✓ Use Tips

- 1) The stress control for cracked section is performed on each axis in program, Also crack control is performed on each axis (y & z axis)
- 2) In GSD, you can also check stress control for cracked section on bi-axis.
- 3) For calculating effective area of concrete in tension for circular cross sections( $A_{c,eff}$ ), program use the proposal by Wiese et al (left side)

- For determing  $\epsilon_{sm} - \epsilon_{cm}$

- 1)  $\epsilon_{sm}$  : The mean strain in the reinforcement under the relevant combination of loads, including the effect of imposed deformations and taking into account the effects of tensile stiffening.
- 2)  $\epsilon_{cm}$  : The mean strain in the concrete between cracks.
- 3)  $\sigma_s$  : The stress in the tension reinforcement
- 4)  $\alpha_e$  :  $E_s / E_{cm}$ .
- 5)  $K_t$  : factor dependent on duration of the load.  
0.6 for short-term load, 0.4 for long-term load
- 6)  $\rho_{p,eff}$  :  $A_s / A_{c,eff}$

- For determing  $S_{r,max}$

- 1)  $\phi$  : bar diameter. The program uses the  $\phi$  of the outer layer.
- 2)  $c$  : cover to the longitudinal reinforcement.
- 3)  $k_1$  : A coefficient accounting the bond properties of rebar (0.8 for high bond bars)
- 4)  $k_2$  : Coefficient accounting for distribution of strain. (0.5 for bending)
- 5)  $k_3$  : 3.4 (recommended values)
- 6)  $k_4$  : 0.425(recommended values)

## 5. SCWB Design/Checking Method Option as per ACI Series

### Add Nominal Strength Method for design force calculation special provision for seismic design

- Design > RC Design > Design Code > SCWB Design/Checking Method

#### SCWB Design/Checking Option

SCWB Design/Checking Method

☐ Design Strength

☒ Nominal Strength

#### ✓ Use Tips

- 1) The applied codes is ACI318-19,14(including M), NSR-10, NSCP2015
- 2) This option can be activated when
  - ① ACI 318-19,14 , NSCP-2015: Special Moment Frames in Seismic Design Parameter
  - ② NSR-10 : DES(Special Energy Dissipation) or DMO (Moderate Energy Dissipation) Class in Seismic Design Parameter

#### ✓ Note

1.Column design moment as per options performing Ductile Design& Checking

**[Design Strength Method]** Using the Design strength of beams,  $\phi_b M_n$

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

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

**[Nominal Strength Method]** Using the nominal strength of beams,  $M_n$

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

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

2.SCWB Ratio Calculation as per options performing SCWB Design & Checking

**[Design Strength Method]** Using the Design strength of beams and Column,  $\phi_b M_{nb}$ ,  $\phi_c M_{nc}$

$$\text{Ratio} = \left( \frac{\phi_c M_{nc,T} + \phi_c M_{nc,B}}{\phi_b M_{nb,L} + \phi_b M_{nb,R}} \right)$$

**[Nominal Strength Method]** Using the nominal strength of beams&Column ,  $M_{nb}$ ,  $M_{nc}$

$$\text{Ratio} = \left( \frac{M_{nc,T} + M_{nc,B}}{M_{nb,L} + M_{nb,R}} \right)$$

## 6. Thailand Code : DPT (Wind and Seismic load)

### Add DPT.1311-50:2007(Wind Load)



#### Wind Load

##### Add/Modify Wind Load Specification

Load Case Name : WX

Wind Load Code : DPT.1311-50:2007

Description :

☐ Wind Load Parameters

Application Method

☐ Simplified Method ☒ General Method

Common Parameters

Wind Zone : Zone 1

Basic Wind Speed : 25 m/sec

Terrain Category : C

Importance Factor : 1.00

Topographic Effects

☐ Include Topographic Effects

Hill Shape : 2D Ridge or Valley

Building Location : Upwind

Hill Height : 0 m

Hill Length : 0 m

Crest-Building Distance : 0 m

Gust Factors and Pressure Coefficient

Auto Calculate by Structure Information...

Major : 2.5 Ortho. : 2.5

Additional Parameters

☐ Across Wind

☐ Torsional Wind

☐ Wind Response (Disp. / Accel.)

Parameters of Wind Vibration...

Wind Load Direction Factor (Scale Factor)

X-Dir. : 1 Y-Dir. : 0 Z-Rot. : 0

Additional Wind Loads (Unit:N,mm)

Story	Along Add.-X	Along Add.-Y	Across Add.-X
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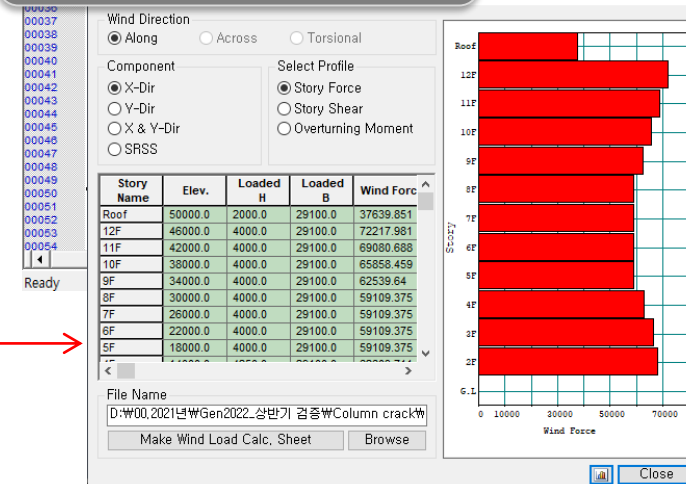
Wind Load Profile... OK Cancel Apply

#### Wind load Calc.Sheet per DPT1311-05(2007)

WIND LOADS BASED ON DPT.1311-50:2007 (DETAILED METHOD) (UNIT: N, mm)

- BASIC INPUT DATA
  - Design Code : DPT.1311-50:2007
  - Calculation Method : Detailed Method
  - Wind Zone : 1
  - Average Roof Height : 50000.00
  - Basic Wind Speed, V50 : 25.00
  - Exposure Category : B
  - Importance Factor, Iw : 1.00
  - Fundamental Natural Frequency (Hz) : Major = 0.00, Ortho. = 0.00
  - Damping Ratio : Major = 0.0000, Ortho. = 0.0000
- GUST FACTOR
  - Cg (Major) : 2.50
  - Cg (Ortho.) : 2.50
- TOPOGRAPHIC EFFECT
  - Not Considered
- EQUATION FOR WIND LOADS
  - Wind Force : F = p A
  - Wind Pressure : p = Iw q Ce Cg Cp
  - Design Wind Pressure : q = 1/2 rho (V50 TF)^2
- SCALE FACTOR FOR WIND LOADS
  - X-directional Wind Loads : SFx = 1.00
  - Y-directional Wind Loads : SFy = 0.00

#### Wind load profile per DPT1311-05(2007)





## 6. Thailand Code : DPT (Wind and Seismic load)

Add DPT.1301/1302-61:2018(Seismic Load)



### Static seismic Load

Add/Modify Seismic Load Specification

Load Case Name : EX

Seismic Load Code : DPT.1301/1302-61:2

Description :

☐ Seismic Load Parameters

Region  
☒ Bangkok ☐ Region except Bangkok

Method  
☐ By Graph 1.4.6~7 ☒ By Table 1.4-4~5

Seismic Zone  
 Seismic Zone 2

Design Spectral Acceleration  
 Site Class Sd ☒ by Code

Ss 0.75 Fa 1.2 Sds 0.6 g  
 S1 0.30 Fv 1.8 Sd1 0.36 g  
 Period Coef. (Cu) 1.5

Category  
 Risk Category II  
 Importance 1.00

Seismic Design Category  
 Sds 0

### Define Factors per DPT1301/1302-61(2018)

Structural Parameters

☐ Analytical Period  
☒ Approximate Fundamental Period

Response Mod.  
 Damping Ratio

Seismic Load D  
 X-Direction : 1

Accidental Ecc  
 X-Direction (Ex  
 Y-Direction (Ey

Torsional Amplification

Period Calculator

Major Direction  
☒ 1.  $T = 0.02 H$  ( for RC )  
☐ 2.  $T = 0.03 H$  ( for Steel )  
☐ 3.  $T = N + H$  ( User Input )

H 50 m  
 N 0.025

Calculate

Period 1 sec

Ortho. Direction  
☒ 1.  $T = 0.02 H$  ( for RC )  
☐ 2.  $T = 0.03 H$  ( for Steel )  
☐ 3.  $T = N + H$  ( User Input )

H 50 m  
 N 0.025

Calculate

Period 1 sec

OK Cancel

### Response Spectrum

Generate Design Spectrum

Design Spectrum : DPT.1301/1302-61:2018

Region  
☒ Bangkok ☐ Region except Bangkok

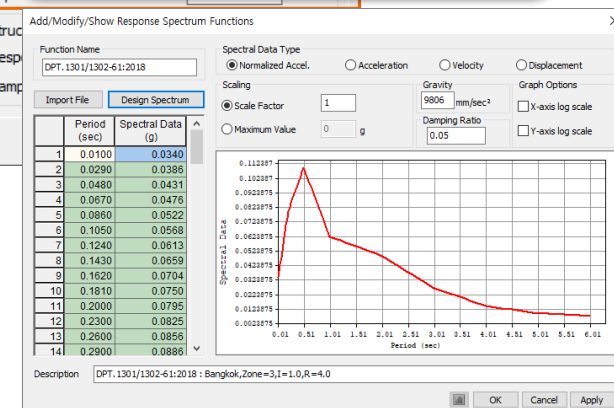
Method  
☐ By Graph 1.4.6~7 ☒ By Table 1.4-4~5

Seismic Zone  
 Seismic Zone 2

Design Spectral Acceleration  
 Site Class Sd ☒ by Code

Ss 0.75 S1 0.30  
 Fa 1.2 Sds 0.6 g  
 Fv 1.8 Sd1 0.36 g

Auto-Draw Response Spectrum Functions  
 per DPT1301/1302-61(2018))





## 7. Addition of Thailand DB(TIS for SI,MKS)

**Add Concrete/Rebar DB and material as per TIS(for SI,MKS Unit system)**

### Set Rebar Material

Preferences

- Environment
  - General
  - View
  - Data Tolerances
  - Property
  - Load
  - Results
  - Design/Load Code
  - Notice & Help
  - Graphics
- Output Formats
  - Formats - Dim, & Others
  - Formats - Forces
  - Formats - Loads

Design Code | Load Code

Steel  
Design Code: AISC(15h)-LRFD  
National Annex: Recommended

Concrete  
Design Code: ACI318M-14  
National Annex: Recommended

Cold Formed Steel  
Design Code: AIK-CFSD98  
National Annex: Recommended

SRC  
Design Code: AIK-SRC2K

Rebar  
Material Code: TIS(RC)  
Material DB: SR24

Rebar Material Code: TIS(MKS)(RC)  
Material DB: SR24

SR24  
SD30  
SD40  
SD50

☒ Save Changes Upon OK

Default All Set Default OK Cancel

### Rebar strength as per TIS

	Tensile Strength Fu (MPa)	Yield Strength Fy (MPa)	Yield Strength Fy (KSC)
SR 24	385	235	2400
SD 30	480	295	3000
SD 40	560	390	4000
SD 50	620	490	5000

### Rebar DB as per TIS & Design rebar setting

Rebar Information

Rebar Code: TIS(MKS)

CHK	Name	Dia (mm)	Area (mm <sup>2</sup> )	Dia(Out) (mm)	Weight (tonf/mm)
<input type="checkbox"/>	DB6	6.0000	22.2000	6.0000	0.0000
<input type="checkbox"/>	DB8	8.0000	39.5000	8.0000	0.0000
<input type="checkbox"/>	DB10	10.0000	61.6000	10.0000	0.0000
<input type="checkbox"/>	DB12	12.0000	88.8000	12.0000	0.0000
<input type="checkbox"/>	DB16	16.0000	157.8000	16.0000	0.0000
<input checked="" type="checkbox"/>	DB20	20.0000	246.6000	20.0000	0.0000
<input type="checkbox"/>	DB22	22.0000	298.4000	22.0000	0.0000
<input type="checkbox"/>	DB25	25.0000	385.3000	25.0000	0.0000
<input type="checkbox"/>	DB28	28.0000	483.4000	28.0000	0.0000
<input type="checkbox"/>	DB32	32.0000	631.3000	32.0000	0.0000
<input type="checkbox"/>	DB36	36.0000	799.0000	36.0000	0.0000
<input type="checkbox"/>	DB40	40.0000	986.5000	40.0000	0.0000
<input type="checkbox"/>	RB6	6.0000	22.2000	6.0000	0.0000
<input type="checkbox"/>	RB8	8.0000	39.5000	8.0000	0.0000
<input type="checkbox"/>	RB9	9.0000	49.9000	9.0000	0.0000
<input type="checkbox"/>	RB10	10.0000	61.6000	10.0000	0.0000

OK Close

### Concrete strength as per TIS

Material Data

General  
Material ID: 7 Name: C150

Elasticity Data  
Type of Design: Concrete

Steel  
Standard: DB  
Product: Product

Concrete  
Standard: TIS(MKS)(RC)  
Code: C150

Type of Material  
☒ Isotropic ☐ Orthotropic

Steel  
Modulus of Elasticity: 0.0000e+00 N/mm<sup>2</sup>  
Poisson's Ratio: 0  
Thermal Coefficient: 0.0000e+00 1/[C]  
Weight Density: 0 N/mm<sup>3</sup>  
Use Mass Density: 0 N/mm<sup>3</sup>/g

Concrete  
Modulus of Elasticity: 2.1324e+09 N/mm<sup>2</sup>  
Poisson's Ratio: 0.2  
Thermal Coefficient: 1.0000e-05 1/[C]  
Weight Density: 2.354e-05 N/mm<sup>3</sup>  
Use Mass Density: 2.4e-09 N/mm<sup>3</sup>/g

Elasticity Data  
Elastic Material Name: NONE

Elastic Material Properties for Fiber Model  
Concrete: None Rebar: None

Thermal Transfer  
Specific Heat: 0 kcal/[N][C]  
Heat Conduction: 0 kcal/[mm][hr][C]  
Damping Ratio: 0.05

OK Cancel Apply

## 8. Addition of Indonesia DB(SNI)

### Add Concrete/Rebar DB and material as per SNI

#### Set Rebar Material

Preferences

Environment

- General
- View
- Data Tolerances
- Property
- Load
- Results
- Design/Load Code
- Notice & Help
- Graphics
- Output Formats
  - Formats - Dim, & Others
  - Formats - Forces
  - Formats - Loads

Design Code | Load Code

Steel

Design Code: AISC(15th)-LRFL

National Annex: Recommended

Cold Formed Steel

Design Code: AIK-CFSD98

National Annex: Recommended

Concrete

Design Code: ACI318M-14

National Annex: Recommended

Rebar

Design Code: AIK-SRC2K

Material Code: SNI(RC)

Material DB: BJTP 280

OK

Cancel

Save Changes Upon OK

Default All

#### Rebar DB as per SNI & Design rebar setting

Rebar Information

Rebar Code: SNI

CHK	Name	Dia (mm)	Area (mm <sup>2</sup> )	Dia(Out) (mm)	Weight (N/mm)
<input type="checkbox"/>	D6	6.0000	28.2740	6.0000	0.0022
<input type="checkbox"/>	D8	8.0000	50.2660	8.0000	0.0039
<input type="checkbox"/>	D10	10.0000	78.5400	10.0000	0.0061
<input type="checkbox"/>	D13	13.0000	132.7330	13.0000	0.0102
<input type="checkbox"/>	D16	16.0000	201.0620	16.0000	0.0155
<input type="checkbox"/>	D19	19.0000	283.5290	19.0000	0.0218
<input checked="" type="checkbox"/>	D22	22.0000	380.1340	22.0000	0.0293
<input checked="" type="checkbox"/>	D25	25.0000	490.8750	25.0000	0.0378
<input type="checkbox"/>	D29	29.0000	660.5210	29.0000	0.0508
<input type="checkbox"/>	D32	32.0000	804.2500	32.0000	0.0619
<input type="checkbox"/>	D36	36.0000	1017.8780	36.0000	0.0784
<input type="checkbox"/>	D40	40.0000	1256.6400	40.0000	0.0967
<input type="checkbox"/>	D50	50.0000	1963.5000	50.0000	0.1511
<input type="checkbox"/>	D54	54.0000	2290.2260	54.0000	0.1763
<input type="checkbox"/>	D57	57.0000	2551.7650	57.0000	0.1964

OK

Close

#### Rebar strength as per SNI

Grade	Tensile Strength Fu (MPa)	Yield Strength Fy (MPa)
BjTP 280	350	280
BjTS 280	350	280
BjTS 420A	525	420
BjTS 420B	525	420
BjTS 520	650	520
BjTS 550	687.5	550
BjTS 700	805	700

#### Concrete strength as per SNI

Material Data

General

Material ID: 7

Name: fc17

Elasticity Data

Type of Design: Concrete

Steel

Standard: DB

Product: DB

Concrete

Standard: SNI(RC)

Code: fc17

Code: fc21

Code: fc25

Code: fc30

Code: fc35

Code: fc40

Code: fc45

Code: fc50

Code: fc55

Code: fc60

Type of Material: ☒ Isotropic ☐ Orthotropic

Modulus of Elasticity: 0.0000e+00 N/mm<sup>2</sup>

Poisson's Ratio: 0

Thermal Coefficient: 0.0000e+00 1/[C]

Weight Density: 0 N/mm<sup>3</sup>

Use Mass Density: 0 N/mm<sup>3</sup>/g

Concrete

Modulus of Elasticity: 1.9378e+04 N/mm<sup>2</sup>

Poisson's Ratio: 0.2

Thermal Coefficient: 1.0000e-05 1/[C]

Weight Density: 2.354e-05 N/mm<sup>3</sup>

Use Mass Density: 2.4e-09 N/mm<sup>3</sup>/g

Elasticity Data

Elastic Material Name: NONE

Elastic Material Properties for Fiber Model

Concrete: None

Rebar: None

Thermal Transfer

Specific Heat: 0 kcal/[N][C]

Heat Conduction: 0 kcal/[mm][hr][C]

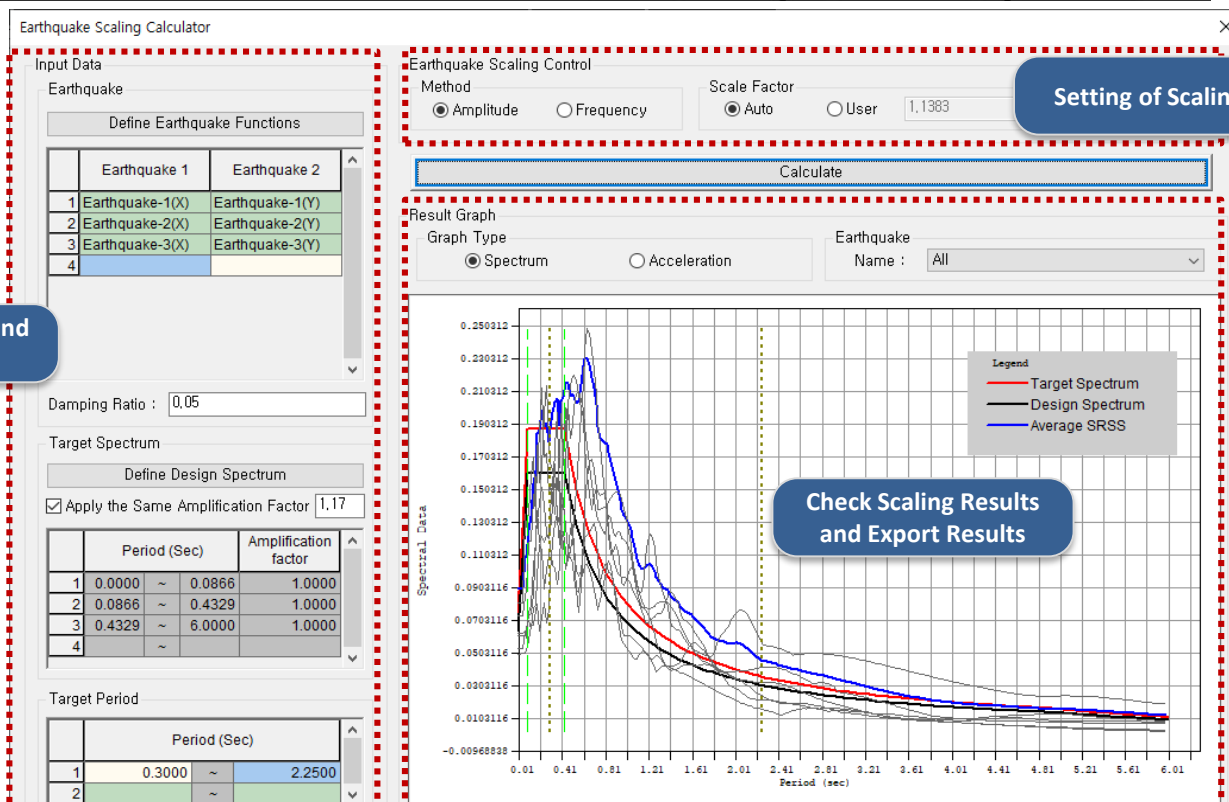
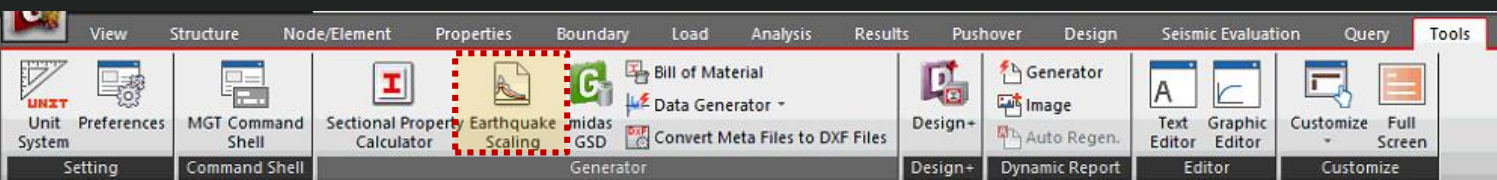
Damping Ratio: 0.05

OK

Cancel

Apply

## 9. Earthquake Scaling Calculator



Input Seismic wave and target spectrum

Setting of Scaling method and scale factor

Check Scaling Results and Export Results

**-Function :** Scaling so that the average of the SRSS spectrum of the input seismic wave is greater than or equal to the target spectrum for the target period

## 9. Earthquake Scaling Calculator

### -Tools > Generator > Earthquake Scaling

**Earthquake Scaling Calculator**

**1** **Input Data**  
Earthquake

Define Earthquake Functions

	Earthquake 1	Earthquake 2
1	Earthquake-1(X)	Earthquake-1(Y)
2	Earthquake-2(X)	Earthquake-2(Y)
3	Earthquake-3(X)	Earthquake-3(Y)
4		

Damping Ratio : 0.05

**2** **Target Spectrum**

Define Design Spectrum

☒ Apply the Same Amplification Factor 1.17

	Period (Sec)	Amplification factor
1	0.0000 ~ 0.0866	1.0000
2	0.0866 ~ 0.4329	1.0000
3	0.4329 ~ 6.0000	1.0000
4		

**3** **Target Period**

	Period (Sec)
1	0.3000 ~ 2.2500
2	

**4** Import Input Data Export Input Data

**Add/Modify/Show Earthquake Functions**

Function Name: Earthquake-1(X)

Time Function Data Type: Gravity

Normalized Acceleration: 9.806 m/sec<sup>2</sup>

Import

Time (sec)	Function (g)
1	0.0200 0.0010
2	0.0400 0.0008
3	0.0600 0.0006
4	0.0800 0.0005
5	0.1000 0.0003
6	0.1200 0.0009
7	0.1400 0.0015
8	0.1600 0.0014
9	0.1800 0.0009
10	0.2000 0.0004
11	0.2200 -0.0001
12	0.2400 0.0010
13	0.2600 0.0020
14	0.2800 0.0029

Time History Data

Time (sec)

Time History Data

OK Cancel Apply

**Generate Design Spectrum**

Design Spectrum : KDS(41-17-00:2019)

Design Spectral Response Acceleration

Seismic Zone: 1

EPA(S): 0.22

Site Class: S2

Fa: 1,38000 Sds: 0,50600 g

Fv: 1,38000 Sd1: 0,20240 g

Importance Factor (Ie): 1,2

Response Modification Coef. (R): 4

Max. Period : 6 (Sec)

OK Cancel

**1** Enter seismic wave information considering the conditions of the ground where the structure is located.

Import seismic waves saved as SGS files or copy and paste input data into Excel format.

**2** Set the design response spectrum according to the standard and input the magnification of the target spectrum. When inputting the design response spectrum, a certain section of acceleration is automatically divided

**3** Set the scaling target period.

**4** Import and export input data as wzd files.

# 9. Earthquake Scaling Calculator

## -Tools > Generator > Earthquake Scaling

**5** Earthquake Scaling Control

Method: ☒ Amplitude ☐ Frequency      Scale Factor: ☒ Auto ☐ User 1.1383

Calculate

**6** Result Graph

Graph Type: ☒ Spectrum ☐ Acceleration      Earthquake Name: All

**7** Export Results to T.H Funcs.      Export Results to SGS files      Export Results to Excel      Close

- 5** Set the method and scale factor of earthquake scaling control.
- 6** Check the scaling results in spectrum and acceleration graphs.
- 7** The scaled seismic wave results can be exported as SGS files or time history functions, or saved as Excel files.

### Example of T.H function export

Time History Analysis

Time Forcing Functions : 6

- Function 1 [ Earthquake-1(X)-1.1 ]
- Function 2 [ Earthquake-1(Y)-1.1 ]
- Function 3 [ Earthquake-2(X)-1.1 ]
- Function 4 [ Earthquake-2(Y)-1.1 ]
- Function 5 [ Earthquake-3(X)-1.1 ]
- Function 6 [ Earthquake-3(Y)-1.1 ]

Add/Modify/Show Time History Functions

Function Name: Earthquake-1(X)-1.1

Time Function Data Type: ☒ Normalized Accel. ☐ Acceleration ☐ Force ☐ Moment ☐ Normal

Scale Factor: 1      Gravity: 9.806 m/sec<sup>2</sup>      Graph Options: ☐ X-axis log scale ☐ Y-axis log scale ☐ F.F.T

Import: ☐ Earthquake ☐ Heel Drop

Time (sec)	Function (g)
1	0.0200 0.0012
2	0.0400 0.0010
3	0.0600 0.0007
4	0.0800 0.0005
5	0.1000 0.0004
6	0.1200 0.0010
7	0.1400 0.0017
8	0.1600 0.0016
9	0.1800 0.0011
10	0.2000 0.0005
11	0.2200 -0.0001
12	0.2400 0.0011
13	0.2600 0.0023
14	0.2800 0.0033

Description: Generate Earthquake Response Spectrum...      OK      Cancel      Apply

### Example of excel export

[1] Earthquake-100, Earthquake-100 (Amplitude)

**Spectrum**

**Acceleration (Earthquake-1(X))**

**Spectral Data (g)**

Period (sec)	Earthquake ke-100	Earthquake ke-100	SRSS	Scale Factor
0.02	0.081256	0.073131	0.109319	-
0.02	0.081145	0.072996	0.109146	-
0.04	0.081088	0.072938	0.109065	-
0.06	0.135739	0.084773	0.160036	-
0.08	0.127343	0.089142	0.155443	-

**Acceleration Data (g)**

Time (sec)	Earthquake e-100
0.02	0.001177
0.02	0.000959
0.06	0.000738
0.08	0.000518
0.10	0.000383

Average Spectrum      Target Spectrum      Earthquake Set-1      Earthquake Set-2      Earthquake Set-3      Close

## 10. Preview function of Start Page

- You can see the latest news of midas program in banner.
- Recent projects can be previewed and opened by clicking on the list.

### Welcome to MIDAS

[MIDAS Blog]

Fundamentals of Seismic Isolation Analysis

Go to MIDAS Customer Online Support [Knowledge Base]

You can download the newest version of products. [Tickets]

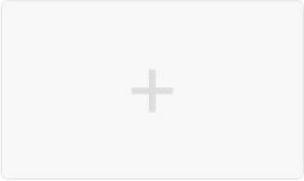
We can help you find solutions and answers.

[MIDAS Webinar]

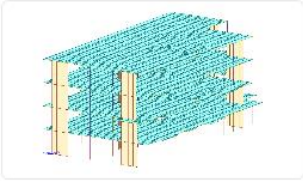
RC Shell Design as per EC2

Dec 13th 2021 - Dec 28th 2021

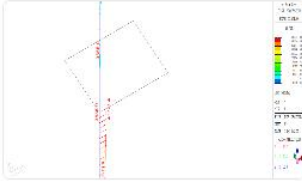
#### Recent



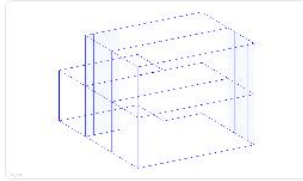
New Project




CEV+003 Attivi solo SLVXY-211  
209-GBA  
2021-12-13 09:41:12



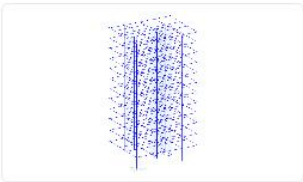
Def\_design4 - EC08  
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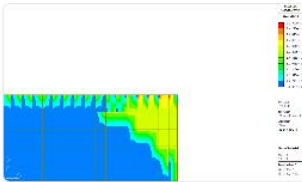
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2021-12-09 12:29:41



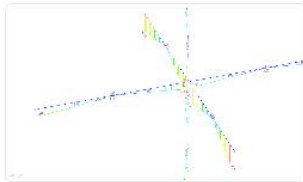
slab(ACI318-14)  
2021-12-08 19:15:34



RC(ACI318-14)  
2021-12-08 16:33:16



Query  
2021-12-08 09:21:04

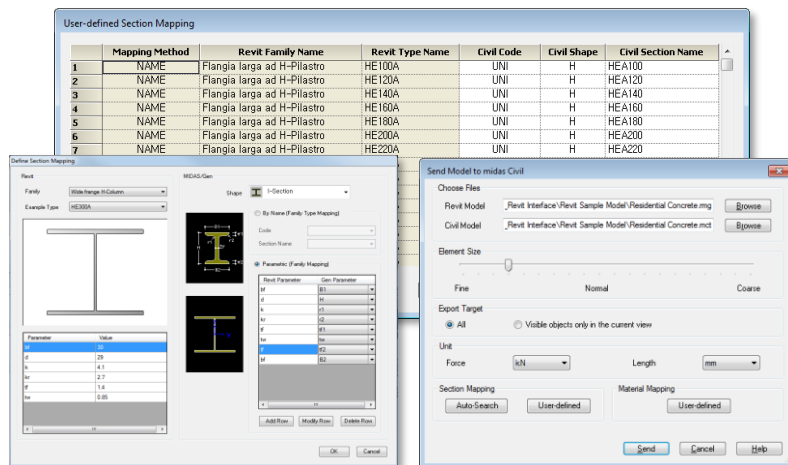


210929\_Edificio Ensemble3  
2021-12-08 10:54:08

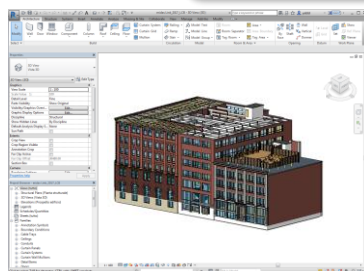
# 11. Revit 2022 Interface

## Gen-Revit Linker

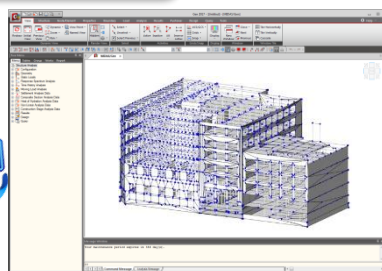
- File > Import > **midas Gen MGT File**
- File > Export > **midas Gen MGT File**



Send Model to midas Gen



Revit 2022



Gen2022 v1.1 (New version)

	Functions	Revit <> Gen
Linear Elements	Structural Column	<>
	Beam	<>
	Brace	<>
	Curved Beam	>
	Beam System	>
	Truss	>
Planar Elements	Foundation Slab	<>
	Structural Floor	<>
	Structural Wall	<>
	Wall Opening & Window	>
	Door	>
	Vertical or Shaft Opening	>
Boundary	Offset	>
	Rigid Link	>
	Cross-Section Rotation	>
	End Release	>
	Isolated Foundation Support	>
	Point Boundary Condition	>
	Line Boundary Condition	>
	Wall Foundation	>
	Area Boundary Condition	>
	Load Nature	>
Load	Load Case	>
	Load Combination	>
	Hosted Point Load	>
	Hosted Line Load	>
	Hosted Area Load	>
	Material	<>
Other Parameters	Level	>