

Release Note

Release Date : Aug. 2021

Product Ver. : nGen 2022 (v1.1)

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1. nGen-Revit link : Export Rebar to Revit

Export the rebar information of nGen to Revit model.

Set Rebar Detail

Output > Revit Link > Setting > Rebar Detail

Structure Define Member Body Load Boundary Analysis Design Results Output Options

Generate Report Settings Generate Drawing Setting Import Export

MIDAS Report MIDAS Drawing Rebar Detail Member Detail

Development Length in Tension (Ldt)

Slab/Beam/Footing Column/Pedestal Wall/Plate

General Tension Rebar (unit : m) (Good)

Fy	Fck	RB6 (m)	RB8 (m)	RB9 (m)	DB10 (m)	DB12 (m)
SR24	C30/37	0.12	0.15	0.18	0.20	0.24
SD30	C30/37	0.15	0.20	0.22	0.24	0.29
SD40	C30/37	0.20	0.26	0.29	0.33	0.39
SD50	C30/37	0.24	0.33	0.36	0.41	0.48

Consider Top Tension rebar detail. (Poor)

Tension Rebar placed top over fresh concrete (unit : m)

Fy	Fck	RB6 (m)	RB8 (m)	RB9 (m)	DB10 (m)	DB12 (m)
SR24	C30/37	0.17	0.23	0.25	0.28	0.34
SD30	C30/37	0.21	0.28	0.32	0.35	0.42
SD40	C30/37	0.28	0.37	0.42	0.46	0.55
SD50	C30/37	0.35	0.47	0.52	0.58	0.70

Auto Calculator

Rebar Detail

Development Length in Tension (Ldt)

Development Length in Compression (Ldc)

Splice Length in Tension (Lst)

Splice Length in Compression (Lsc)

Development Length of Std. Hook in Tension (Ldh)

Auto-calculation(Batch)

Auto Calculator

Reference Code EN1992-1-1-2004

Set the length for the development and splice of the rebar.
Auto-calculation only supports Eurocode. For other design codes, copy & paste the values calculated in Excel.

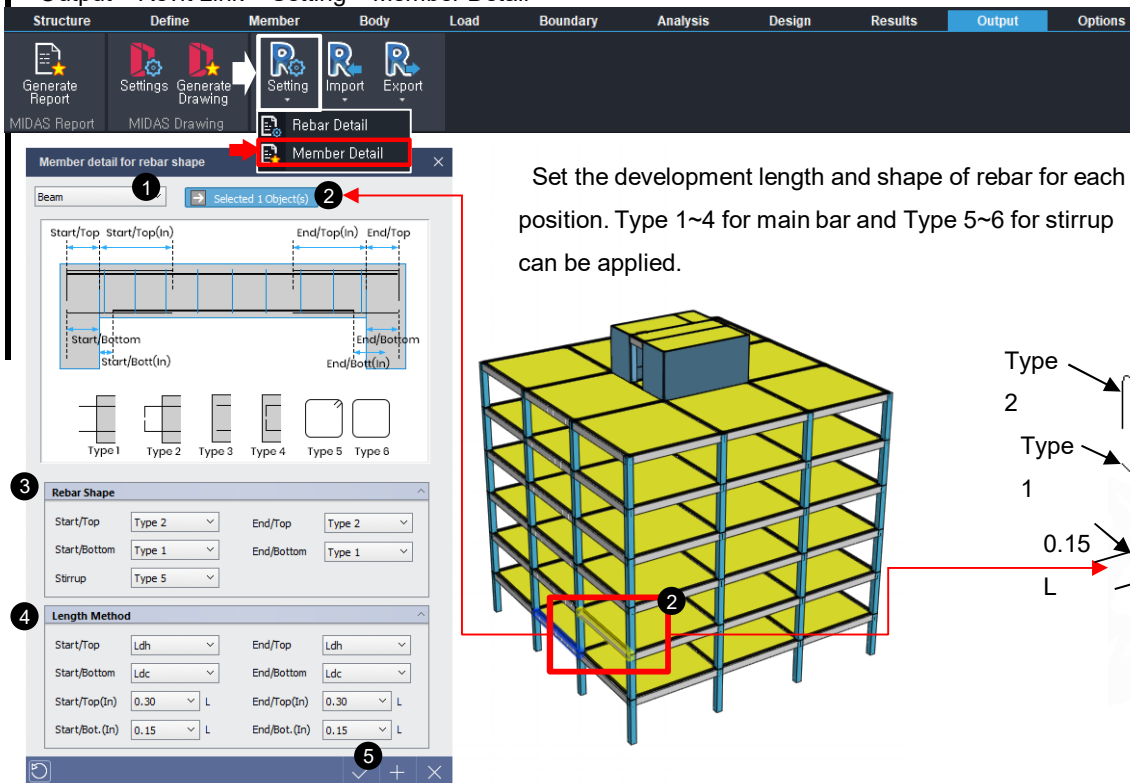
- ❶ Click the type of development or splice.
- ❷ Select the member type tap.
- ❸ Click "Auto Calculator".
- ❹ Select the reference code.
- ❺ Click "V" button.
- ❻ Click "V" button.

1. nGen-Revit link : Export Rebar to Revit

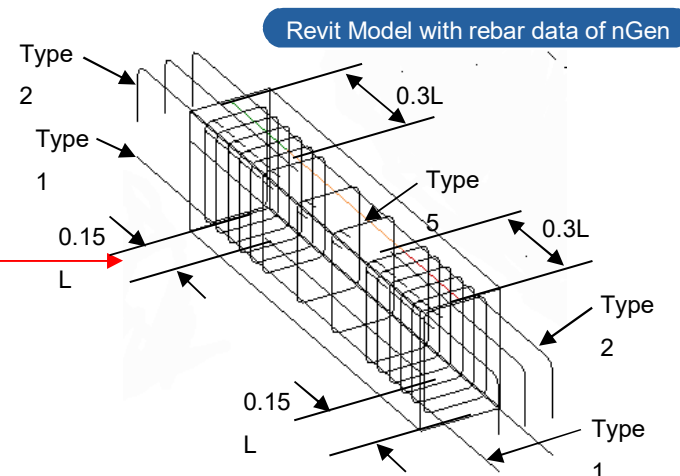
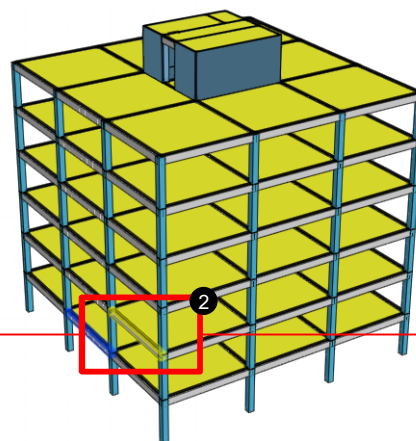
Export the rebar information of nGen to Revit model.

Set Member Detail

Output > Revit Link > Setting > Member Detail



- ❶ Select the member type.
- ❷ Select the target elements.
- ❸ Set the shape type of rebar at each position.
- ❹ Set the length of rebar at each position.
- ❺ Click "V" button.



1. nGen-Revit link : Export Rebar to Revit

Export the rebar information of nGen to Revit model.

Member detail & Default setting

Member detail for rebar shape

Beam

Selected 1 Object(s)

Start/Top Start/Top(In) End/Top End/Top(In)
Start/Bottom Start/Bottom(In) End/Bottom End/Bottom(In)

Type 1 Type 2 Type 3 Type 4 Type 5 Type 6

Rebar Shape

☐ Dowel bar of footing

Start/Top Type 2 End/Top Type 2
Start/Bottom Type 1 End/Bottom Type 1
Stirrup Type 5

Length Method

Start/Top Ldh End/Top Ldh
Start/Bottom Ldc End/Bottom Ldc
Start/Top(In) 0.30 L End/Top(In) 0.30 L
Start/Bottom(In) 0.15 L End/Bottom(In) 0.15 L

Beam Type

Member detail for rebar shape

Column

Selected 1 Object(s)

Top
Dowel 1
Bottom
Dowel 2

Type 1 Type 2
Type 3 Type 4
Type 5 Type 6

Rebar Shape

☐ Dowel bar of footing

Top Type 1 Bottom Type 3
Dowel 1 Type 1 Dowel 2 Type 1
Hoop Type 6

Length Method

Top Lst Bottom
Dowel 1 Lst Dowel 2 Ldt

Column Type

Member detail for rebar shape

Wall

Selected 1 Object(s)

Top
Dowel 1
Bottom
Dowel 2

Type 1 Type 2
Type 3 Type 4
Type 5 Type 6

Rebar Shape

☐ Dowel bar of footing

Ver./Top Type 1 Ver./Bottom Type 3
Dowel 1 Type 1 Dowel 2 Type 2
Hor./Start Type 1 Hor./End Type 1
End hoop Type 5

Length Method

Ver./Top Lst Ver./Bottom
Dowel 1 Ldt Dowel 2 Ldt
Hor./Start Ldt Hor./End Ldt

Shear Wall

Member detail for rebar shape

Slab

Selected 1 Object(s)

X-Start/Top X-End/Top
X-Start/Bot X-End/Bot
Y-Start
Y-End

Type 1 Type 2
Type 3 Type 4

Rebar Shape

☐ Dowel bar of footing

X-Start/Top Type 2 X-End/Top Type 2
X-Start/Bot Type 1 X-End/Bot Type 1
Y-Start/Top Type 2 Y-End/Top Type 2
Y-Start/Bot Type 1 Y-End/Bot Type 1

Length Method

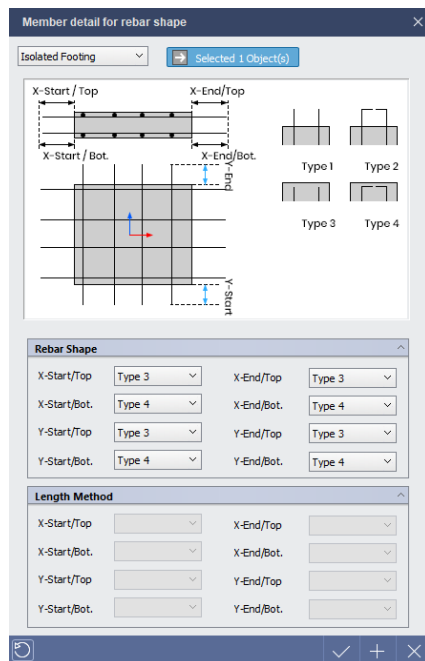
X-Start/Top Ldh X-End/Top Ldh
X-Start/Bot Ldc X-End/Bot Ldc
Y-Start/Top Ldh Y-End/Top Ldh
Y-Start/Bot Ldc Y-End/Bot Ldc

Slab Type

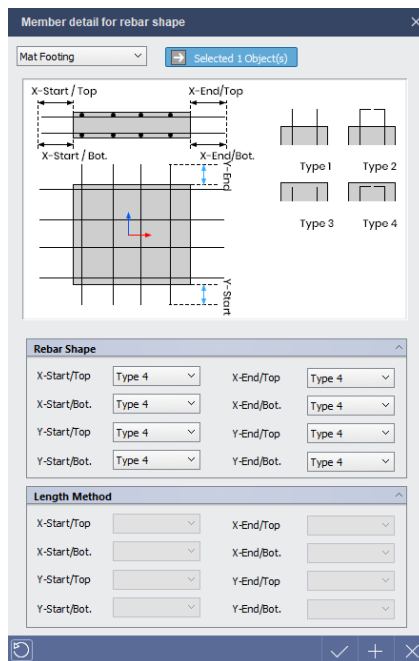
1. nGen-Revit link : Export Rebar to Revit

Export the rebar information of nGen to Revit model.

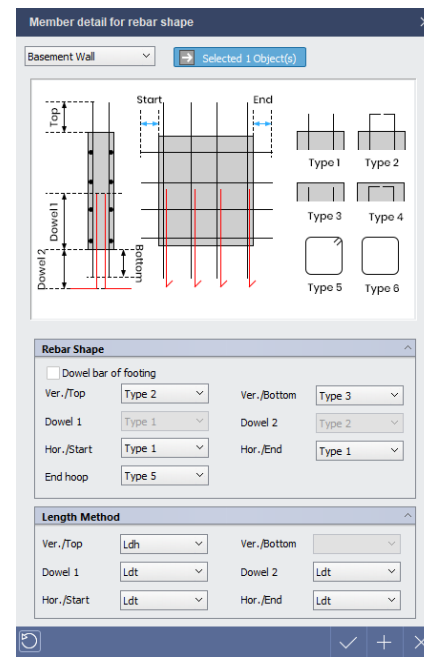
Member detail & Default setting



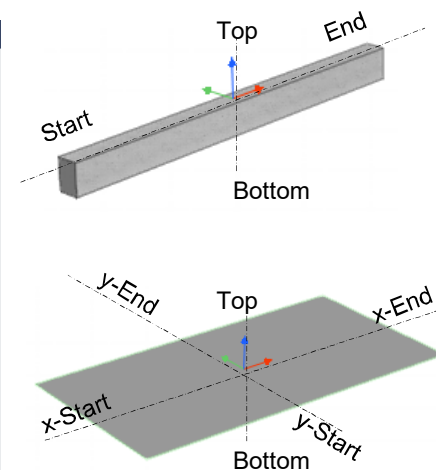
Isolated & Strip Footing



Mat Footing



Basement wall



The position of the rebar is along the local axis of member.

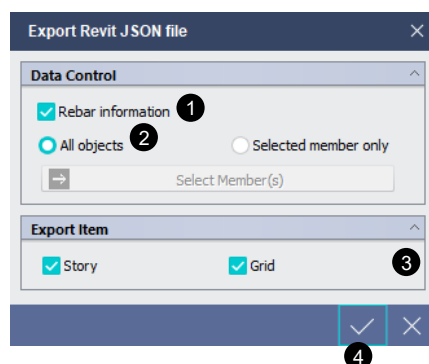
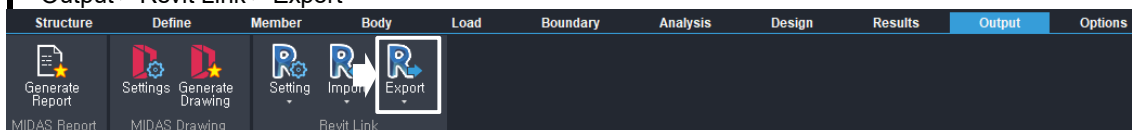
Rebar position

1. nGen-Revit link : Export Rebar to Revit

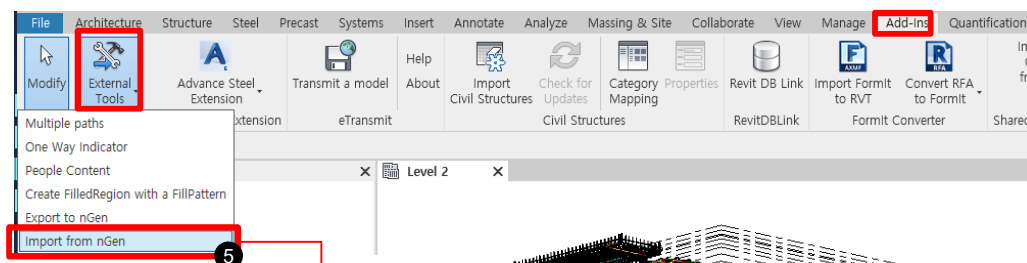
Export the rebar information of nGen to Revit model.

Export nGen model to Revit

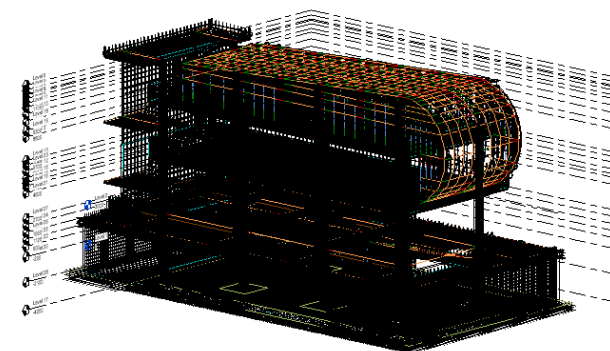
Output > Revit Link > Export



- ① Check on "Rebar Information".
- ② Select all objects
- ③ Check on story or grid date
- ④ Click "V" button and save as Json file.



- ⑤ Run "Import from nGen" and open Json file



1. nGen-Revit link : Export Rebar to Revit

Export the rebar information of nGen to Revit model.

Scope of support

Items (Member)	Supporting	Detail
Beam / sub Beam / Footing Girder	O	<ul style="list-style-type: none"> Support to input rebar in critical zone of beam, column and wall. Support to input dowel rebar for wall and column. Support the rebar data to 2D members with slopes and irregular shapes
Column / sub Column / Pedestal	O	
Wall / Basement Wall	O	
Plate	O	
Slab / Flat Slab	O	
Isolated / Strip / Mat Footing	O	
Brace	X	
Wall column / Plate Beam	X	

- Development type : Support the straight and 90° hook shape (135° hook in hoop bar)
- Hook dimension : Use the auto-calculation in Revit

Rebar Hook Lengths

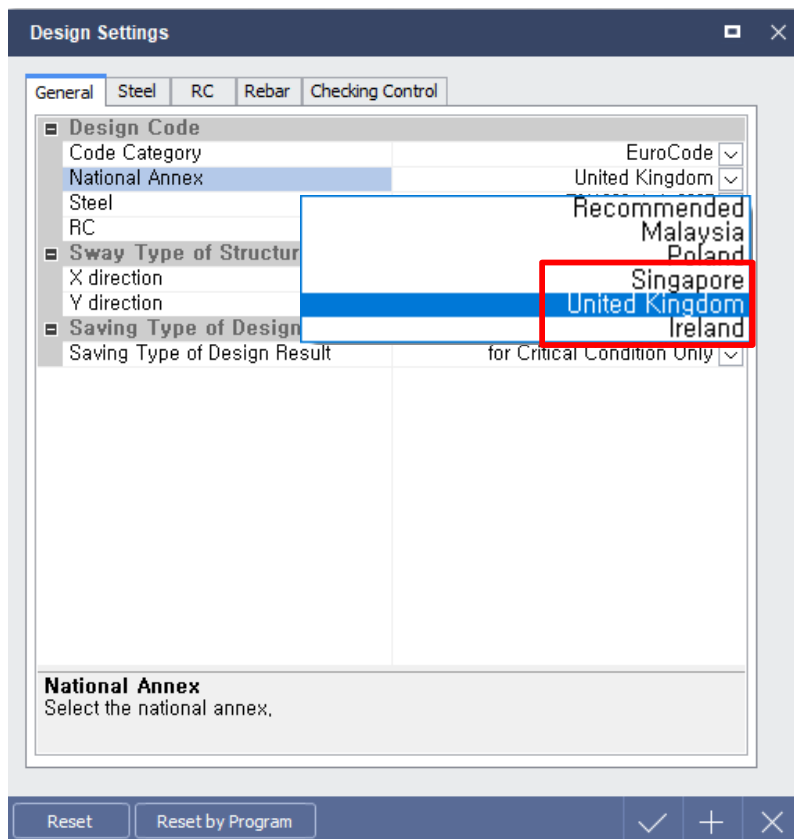
Rebar Bar Type: P12 Rebar Bar Diameter: 12.0 mm

Rebar Hook Length can be automatically calculated based on the Rebar Hook Extension Multiplier property, or the Hook Length can be manually overridden here. The Offset Length is optional and is only used for scheduling

Rebar Hook Type	Auto Calculation	Hook Length	Tangent Length	Offset Length
<input checked="" type="checkbox"/> Standard - 90 deg.	<input checked="" type="checkbox"/>	196.0 mm	196.0 mm	
<input checked="" type="checkbox"/> Standard - 180 deg.	<input checked="" type="checkbox"/>	140.5 mm	100.0 mm	104.0
<input checked="" type="checkbox"/> Stirrup/Tie - 90 deg.	<input checked="" type="checkbox"/>	109.0 mm	109.0 mm	
<input checked="" type="checkbox"/> Stirrup/Tie - 135 deg.	<input checked="" type="checkbox"/>	108.0 mm	109.0 mm	70.2
<input checked="" type="checkbox"/> Stirrup/Tie Seismic - 135 deg.	<input checked="" type="checkbox"/>	108.0 mm	109.0 mm	70.2

2. UK, Ireland and Singapore National Annex

Add National Annex



Applied UK & Singapore & Ireland NA for EN1993-1-1:2005

Prevision	RECOMMENDED	UK (United Kingdom) & Singapore	Ireland
6.1(1) partial safety factor (default)	$\gamma_{M2} = 1.25$	$\gamma_{M2} = 1.10$	$\gamma_{M2} = 1.25$
6.3.2.3(1) parameter $\lambda_{LT,0}$	$\lambda_{LT,0} = 0.4$	$\lambda_{LT,0} = 0.4$ (rolled) $\lambda_{LT,0} = 0.2$ (welded)	$\lambda_{LT,0} = 0.4$
7.2.1(1)B deflection limit (default)	Beam = $L/250$ Colum = $L/250$	Beam = $L/360$ Colum = $L/300$	Beam = $L/360$ Colum = $L/300$
Annex B. kyy~kzz	calculated as Annex A.	calculated as Annex A (UK). $\max(\lambda_z, \lambda_{LT})$ (Singapore)	calculated as Annex B.
[EN 1993-1-5] 5.1(2) NOTE 2	$F_y \leq 460 : 1.2$ ETC : 1.0	All : 1.0 (Only UK)	All : 1.0

2. UK, Ireland and Singapore National Annex

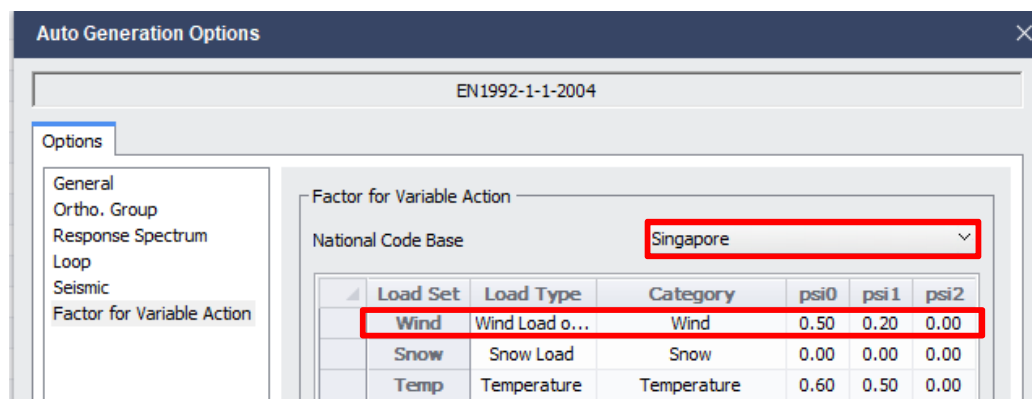
Applied UK & Singapore & Ireland NA for EN1992-1-1:2004

Prevision	RECOMMENDED	UK(United Kingdom) & Singapore	Ireland
3.1.2(2) value of C_{max}	C90/105	(...) Alternatively, <u>shear strength of concrete strength classes higher than C50/60 may be limited to that of C50/60</u>	(...) Alternatively, <u>shear strength of concrete strength classes higher than C50/60 may be limited to that of C50/60</u>
3.1.6(1) value of α_{cc} (default)	$\alpha_{cc} = 1.0$	$\alpha_{cc} = 0.85$	$\alpha_{cc} = 0.85$
6.2.2(1) value of $C_{Rd,c}$, v_{min} , → $V_{Rd,c}$, $\sigma_{cp,limit}$		use the reduced f_{ck} → refer 3.1.2(2)	use the reduced f_{ck} → refer 3.1.2(2)
6.2.2(6) value of v		use the reduced f_{ck} → refer 3.1.2(2)	use the reduced f_{ck} → refer 3.1.2(2)
6.2.3(3) value of v_1 and α_{cw}	$v_1 = 0.6$ ($f_{ck} < 60\text{MPa}$) $v_1 = 0.9 - f_{ck}/200 > 0.5$ ($f_{ck} > 60\text{MPa}$)	[If the design stress of the shear reinforcement is below 80% of the characteristic yield stress f_{yk} ,] $v_1 = 0.54(1 - 0.5 \cdot \cos \alpha)$ ($f_{ck} < 60\text{MPa}$) $v_1 = (0.84 - f_{ck}/200) \cdot (1 - 0.5 \cdot \cos \alpha) > 0.5$ ($f_{ck} > 60\text{MPa}$)	[If the design stress of the shear reinforcement is below 80% of the characteristic yield stress f_{yk} ,] $v_1 = 0.54(1 - 0.5 \cdot \cos \alpha)$ ($f_{ck} < 60\text{MPa}$) $v_1 = (0.84 - f_{ck}/200) \cdot (1 - 0.5 \cdot \cos \alpha) > 0.5$ ($f_{ck} > 60\text{MPa}$)
6.4.5(3) v_{Ed} limit	$V_{Rd,max} = 0.5v f_{cd}$	$V_{Rd,max} = 0.5v f_{cd}$ In addition, v_{Ed} should be limited to $2v_{Rd,c}$ at the first control perimeter.	$V_{Rd,max} = 0.5v f_{cd}$ In addition, v_{Ed} should be limited to $2v_{Rd,c}$ at the first control perimeter.
9.5.3(3) column transverse reinforcement	$s_{cl,tmax} = \min[20D_{bar,min}, Hc, Bc, 400\text{mm}]$	$s_{cl,tmax} = \min[20D_{bar,min}, Hc, Bc, 400\text{mm}]$ check $\alpha_n \alpha_s \omega_{wd} \geq 0.04$ ($> C50/60$)	$s_{cl,tmax} = \min[20D_{bar,min}, Hc, Bc, 400\text{mm}]$ check $\alpha_n \alpha_s \omega_{wd} \geq 0.04$ ($> C50/60$)

2. UK, Ireland and Singapore National Annex

Applied UK & Singapore & Ireland NA for EN1992-1-1:2004

Prevision	RECOMMENDED	UK(United Kingdom) & Singapore	Ireland
Category H : roofs	$\psi_0 = 0.0$ $\psi_1 = 0.0$ $\psi_2 = 0.0$	$\psi_0 = 0.7$ $\psi_1 = 0.0$ $\psi_2 = 0.0$	$\psi_0 = 0.6$ $\psi_1 = 0.5$ $\psi_2 = 0.0$
A1.2.2 (Table A.1.1) Wind	$\psi_0 = 0.6$ $\psi_1 = 0.2$ $\psi_2 = 0.0$	$\psi_0 = 0.5$ $\psi_1 = 0.2$ $\psi_2 = 0.0$	$\psi_0 = 0.6$ $\psi_1 = 0.2$ $\psi_2 = 0.0$



Recommended
Malaysia
Poland
Singapore
United Kingdom
Ireland

Factor for Variable Action in Load Combinations

2. UK, Ireland and Singapore National Annex

Add Singapore NA for Wind Load (EN1991:2005) & Seismic Load (EN1998:2004)

Design Wind Load (Building)

Name: EN1991:2005(Building)-1
Code: EN1991:2005
National Annex: Singapore
Average Roof Height (H): 30 m

Common Parameters

Structure Type: 2
Fund Basic Wind Velocity: 20 m/s
Directional Factor: 1
Seasonal Factor: 1
Turbulence Factor: 1

Orographic Effects

☒ Consider Effects
Orography Category: Cliffs or Escarpment
Building Location: Upwind
Height of Topographic Feature: 5 m
Length of Upwind Slope: 10 m
Length of Downwind Slope: 0 m
Crest Building Distance: 10 m

Effects of Neighbouring High-rise Structures

☒ Consider Effects
Avg. Height of Nearby Structures: 25 m
Distance to the High-Rise: 45 m
Feature of the Neighbouring High-rise Structure
Larger Horizontal Dimension: 30 m
Height: 50 m

Raising of Displacement Height

☐ Consider Effects
Obstruction Height: 0 m
Upwind Spacing: 0 m

Structural Factor

Structural Factor: 1

Report

Design Seismic Load

Name: EN1998:2004(Static)-1
Design: EN1998:2004
National Annex: Singapore

Seismic Load Parameters

Ground Type: C
Response Spectrum Type: Horizontal Ela
☒ Automatic ☐ User Defined
Soil Factor(S): 1.6 Tb: 0.4
Tc: 1.1 Td: 10.4
Ref. Peak Ground Acc.: 0.0178 g
Behavior Factor: 1.5
Lower Bound Factor: 0.2
Importance Factor: 1.4
Viscous Damping Ratio: 5 %

Structural Parameters

☐ Analytical Period ☒ Approximate Period
Major: 0 Ortho: 0
Fundamental Period: 1 2 sec

Report

Dialog Box for Static seismic Load

Design Spectrum

Name: EN1998:2004(RS)-1
Design: EN1998:2004
National Annex: Singapore

Seismic Load Parameters

Ground Type: C
Response Spectrum Type: Horizontal Ela
☒ Automatic ☐ User Defined
Soil Factor(S): 1.6 Tb: 0.4
Tc: 1.1 Td: 10.4
Ref. Peak Ground Acc.: 0.0178 g
Behavior Factor: 1.5
Lower Bound Factor: 0.2
Importance Factor: 1.4
Viscous Damping Ratio: 5 %

Report

Dialog Box for Response Spectrum

3. Thailand Code : DPT (Wind and Seismic load)

Add DPT.1311-50:2007 (Wind Load) & DPT.1301/1302-61:2018 (Seismic Load)



Design Wind Load (Building)

Name: DPT.1301/1311(Building)-1
Code: DPT.1311-50:2007
 National Annex: None
 Average Roof Height (H): 9 m

Application Method
 Method: ☒ Simplified ☐ Detailed

Common Parameters
 Wind Zone: Zone 1
 Basic Wind Speed: 25 m/sec
 Terrain Category: B
 Importance Factor: 1.00

Topographic Effects
☐ Include Topographic Effects
 Hill Shape: 2-D Ridge or Va
 Building Location: Downwind
 Hill Height: 0 m
 Hill Length: 0 m
 Crest-Building Distance: 0 m

Gust Factor and Pressure Coefficient
 Auto Calculate by Structure Information
 Gust Factor (C_g): Major 2.5 Ortho. 2.5

Additional Parameters
☒ Cross Wind
☒ Torsional Wind
☐ Response (Disp. / Accel.)
 Response (Disp. / Accel.)

Dialog Box for Wind Load

Design Seismic Load

Name: DPT.1301/1311(Static)-1
Design: DPT.1301/1302-61:2018
 National Annex: None

Seismic Load Parameters
 Region: ☒ Bangkok ☐ Region except Bangkok
 Method: ☐ By Graph 1.4.6~7 ☒ By Table 1.4.4~5
 Seismic Zone: Zone 1
 Design Spectral Acceleration
 Site Class: Sd ☒ by Code
 S_s 0.75 Fa 1.200 S_{ds} 0.600 g
 S₁ 0.3 F_v 1.800 S_{d1} 0.360 g
 Period Coef. (C_u) 1.500
 Category: Risk Category II Importance 1
 Seismic Design Category: S_{ds} D S_{d1} D => D

Structural Parameters
 Major Ortho
☐ Analytical Period 0 0
☒ Approximate Period 2 0 ...
 Fundamental Period 0 0 sec
 Response Modification Factor (R) 4 4
 Damping 0.025

Dialog Box for Static seismic Load

Design Spectrum

Name: DPT.1301/1311(RS)-1
Design: DPT.1301/1302-61:2018
 National Annex: None

Seismic Load Parameters
 Region: ☒ Bangkok ☐ Region except Bangkok
 Method: ☐ By Graph 1.4.6~7 ☒ By Table 1.4.4~5
 Seismic Zone: Zone 1
 Design Spectral Acceleration
 Site Class: Sd ☒ by Code
 S_s 0.75 Fa 1.200 S_{ds} 0.600 g
 S₁ 0.3 F_v 1.800 S_{d1} 0.360 g
 Category: Risk Category II Importance 1

Structural Parameters
 Response Modification Factor (R) 4
 Damping 0.025

Dialog Box for Response Spectrum

4. Thailand DB : Rebar & Material

Add Rebar DB and material as per TIS

Design Settings

General Steel RC **Rebar** Checking Control

Material

Rebar Arrangement
Alternate Rebar

Rebar Material

Material Standards TIS
Setting range and s... Batch Setting
Main Rebar Grade SR24
Shear Rebar Grade SR24
SD30
SD40
SD50

Set Rebar material

	Tensile Strength Fu (Mpa)	Yield Strength Fy (Mpa)
SR 24	385	235
SD 30	480	295
SD 40	560	390
SD 50	620	490

Rebar strength as per TIS

Setting range and strength by diameter

Beam Column Brace Plate Wall Slab / Foundation Basement Wall

Diameter	Use	Main Rebar		Use	Shear Rebar	
			Fy			Fy
RB6	<input type="checkbox"/>	SR24	235000000.00	<input checked="" type="checkbox"/>	SR24	235000000.00
RB8	<input type="checkbox"/>	SR24	235000000.00	<input checked="" type="checkbox"/>	SR24	235000000.00
RB9	<input type="checkbox"/>	SR24	235000000.00	<input checked="" type="checkbox"/>	SR24	235000000.00
DB10	<input type="checkbox"/>	SD40	390000000.00	<input checked="" type="checkbox"/>	SD40	390000000.00
DB12	<input checked="" type="checkbox"/>	SD40	390000000.00	<input checked="" type="checkbox"/>	SD40	390000000.00
DB16	<input checked="" type="checkbox"/>	SD40	390000000.00	<input type="checkbox"/>	SD40	390000000.00
DB20	<input checked="" type="checkbox"/>	SD40	390000000.00	<input type="checkbox"/>	SD40	390000000.00
DB22	<input checked="" type="checkbox"/>	SD40	390000000.00	<input type="checkbox"/>	SD40	390000000.00
DB25	<input checked="" type="checkbox"/>	SD40	390000000.00	<input type="checkbox"/>	SD40	390000000.00
DB28	<input checked="" type="checkbox"/>	SD40	390000000.00	<input type="checkbox"/>	SD40	390000000.00
DB32	<input checked="" type="checkbox"/>	SD40	390000000.00	<input type="checkbox"/>	SD40	390000000.00
DB36	<input type="checkbox"/>	SD40	390000000.00	<input type="checkbox"/>	SD40	390000000.00

Rebar DB as per TIS & Setting range and strength by diameter

Design for Rebar Arrangement

EN1992-1-1-2004(Recommended)

Beam Column Brace Plate Wall Slab Flat Slab Footing Girder Pedestal Basement Wall Isolated Footing Strip Footing Mat Footing

Section Depth	Main Rebar			Shear Rebar			Skin Bar			
	Min. Diameter	Max. Diameter	Max. Lay.	Min. Diameter	Max. Diameter	Min. Spacing	Increment	Max. Spacing	Min. Diameter	Max. Dia
0.30	DB12	DB16	1 Layer	RB6	DB12	0.10	0.05	0.15	DB12	DB16
0.35	DB12	DB16	1 Layer	RB6	DB12	0.10	0.05	0.15	DB12	DB16
0.40	DB12	DB20	1 Layer	RB6	DB12	0.10	0.05	0.20	DB12	DB16
0.50	DB16	DB20	1 Layer	RB6	DB12	0.10	0.05	0.25	DB12	DB16
0.60	DB16	DB25	1 Layer	RB6	DB12	0.10	0.05	0.25	DB12	DB16
0.70	DB16	DB25	1 Layer	RB6	DB12	0.10	0.05	0.25	DB12	DB16
0.80	DB16	DB25	1 Layer	RB6	DB12	0.10	0.05	0.25	DB12	DB16

Rebar Arrangement for Design under TIS

5. Improvement of Snap

Separate Cad snap and Modeling Snap

- Improved modeling convenience by separating cad snap and model snap
- Control the default settings for cad snap in Global settings.

