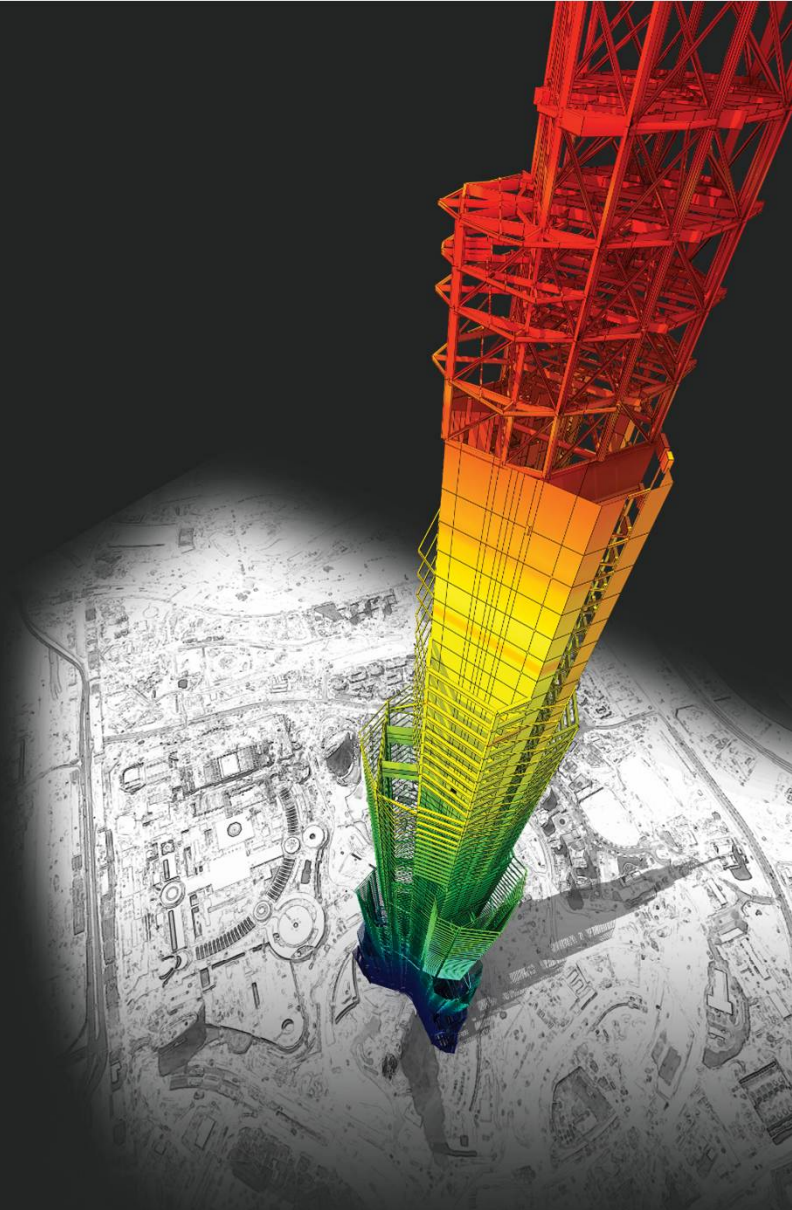


Release Note

Release Date : January. 2023

Product Ver. : midas Gen 2023 (v2.1)



DESIGN OF General Structures

Integrated Design System for Building and General Structures

Enhancements

- **midas Gen**

1) Mexican Concrete Design Code	4
2) Mexican Wind Load	5
3) Mexican Seismic Load	6
4) Import Pushover Hinge Properties	8
5) Improvement for Joint Design (NTC 2018)	9
* Appendix : API Guide to input Mexico Lateral Loads	10

↓ Go to **FREE TRIAL**

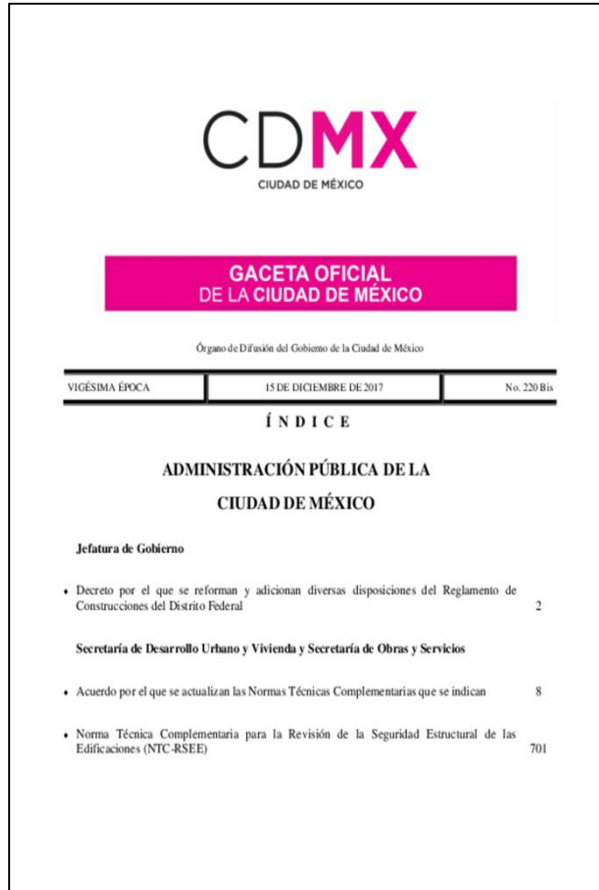
↓ **INSTALLER** DOWNLOAD

midas **Gen**

1. Mexican Concrete Design Code

Added Concrete Design code

- **NTC-DCEC (2017)**



Concrete Design Code X

Design Code : NTC-DCEC(2017) ▼

Check Beam Deflection

Apply Special Provisions for Seismic Design

Seismic Design Parameter

Select Frame Type

High Ductility Structures

Medium Ductility Structures

Low Ductility Structures

Consider strong column-weak beam on last floor

Shear Wall Type

High Ductility Structures

Medium Ductility Structures

Low Ductility Structures

Boundary Element Method

Displacement Based Method

Q 3.00 ▼

R 1

Stress Based Method

Shear for Design Update by Code

$R^*V_c(V_u > (V_g + a_1 \cdot \text{SUM}(M_{pr})/L)/2)$, R = 0

Method

MAX(Ve1, Ve2) MIN(Ve1, Ve2) Ve1 Ve2

Ve1 , $V_g + a_1 \cdot \text{SUM}(M_{pr})/L$, a1 = 1

Ve2 , $V_g + a_2 \cdot V_{eq}$, a2 = 1

SCWB Design/Checking Method

Design Strength Nominal Strength

Beam-Column Joint Design

Select Check Position

Top Bottom

Wall design bending moment for seismic load ...

Member Types to be excluded in Seismic Design

Sub-Beam Cantilever

Underground Beam/Column

Added NTC-DCEC(2017)

Ductility Class for Frame Structure

Ductility Class for Wall Structure

Boundary Element Method for Wall

Seismic Shear Design

Capacity Design (Strong column – Weak beam)

Joint Design

2. Mexican Wind Load

Add/Modify Wind Load Specification

Load Case Name : WX

Wind Load Code : IBC2012(ASCE7-10)

Description :

Alternate Method

Wind Load Parameter

Basic Wind Speed : Eurocode-1(2005)
Eurocode-1(1992)

Exposure Category : BS6399(1997)
KDS(41-10-15:2019)
KBC(2016)
KBC(2009)
Korea(Arch. 2000)
Korea(Arch. 1992)
China(GB50009-2012)
China(GB50009-2001)

Directional Factor : IS875(1987)
Taiwan(2002)
Japan(2004)
Japan(Arch.2000)
Japan(1987)

Gust Effect Factor : IS875(2015)
NSR-10
DPT.1331-50:2007

Force Coefficient :

Wind Eccentricity

X-Dir. (Wx) : Positive Negative None

Y-Dir. (Wy) : Positive Negative None

Wind Load Direction Factor (Scale Factor)

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

Additional Wind Loads (Unit:kN,m)

Story	Add.-X	Add.-Y	Add.-RZ

Add/Modify Wind Load Specification

Load Case Name : WX

Wind Load Code : User Type

Description :

	Story	Elev.	Wind Pressure		Loaded H
			X-Dir	Y-Dir	
	Roof	31.85	0	0	3.025
	8F	25.8	0	0	4.525
	7F	22.8	0	0	3
	6F	19.8	0	0	3
	5F	16.8	0	0	3
	4F	13.8	0	0	3
	3F	10.8	0	0	3
	2F	7.8	0	0	3
	1F	4.8	0	0	3.4
	B1	1	0	0	2.7155
*					

Wind Eccentricity

X-Dir. (Wx) : Positive Negative None

Y-Dir. (Wy) : Positive Negative None

Wind Load Direction Factor (Scale Factor)

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

Additional Wind Loads (Unit:kN,m)

Story	Add.-X	Add.-Y	Add.-RZ

Added "Import" button
(Activated when 'User Type')

[User Type]

- We can generate these data automatically
(Story Name/Elev./ Width for each story)

[How to input the data]

- Click "Import"
- Select the excel file using API function.
(NTCS2017.xlsm or MDOC2020.xlsm)
- Modify excel data
(refer to API Guide to input Mexico lateral loads)
- Export the load to the midas Gen

3. Mexican Seismic Load (Static)

NTCS 2020 & MDOC 2015

Load Case Name : EX

Seismic Load Code : IBC2012(ASCE7-10) Import

Description : IBC2000(ASCE7-98)
UBC(1997)

Seismic Load Parameter: UBC(1991)
Design Spectral Respo: ATC3-06
NBC(1995)

Site Class : D

Ss : 0.75 Fa
S1 : 0.3 Fv

Period Coef. (Cu)

Risk Category

Seis. Design Category : Korea(Arch.2000)
Korea(Arch.1992)

Structural Parameters
China(GB50011-2010)
China(GB50011-2001)
China Shanghai(DGJ08-9-2003)

Analytical Period : IS 1893(2016)
IS 1893(2002)

Approximate Period : Taiwan(2022)
Taiwan(2011)

Fundamental Period : Taiwan(2006)

Response Modification Factor (R) : Taiwan(1999)
Japan(Arch.2000)
NSR-10

Seismic Load Direction Factor : P 100-1(2013)
DPT.1301/1302-61:2018

X-Direction : 1 **User Type**

Accidental Eccentricity
X-Direction (Ex) : Positive Negative None
Y-Direction (Ey) : Positive Negative None

Torsional Amplification
 Accidental Eccentricity Inherent Eccentricity

Additional Seismic Loads (Unit:N,m)

Story	Add.-X	Add.-Y	Add.-RZ

Seismic Load Profile... OK Cancel Apply

Add 'User Type'

Load Case Name : EX

Seismic Load Code : User Type Import

Description :

	Story	Weight	Elev.	Seismic Force	
				X-Dir	Y-Dir
	Roof	1831.29	31.85	0	0
	8F	4646.47	25.8	0	0
	7F	2319.76	22.8	0	0
	6F	2267.92	19.8	0	0
	5F	2267.92	16.8	0	0
	4F	2299.56	13.8	0	0
	3F	2331.2	10.8	0	0
	2F	2331.2	7.8	0	0
	1F	2947.96	4.8	0	0
	B1	4366.04	1	0	0
*					

Seismic Load Direction Factor (Scale Factor)
X-Direction : 1 Y-Direction : 1

Accidental Eccentricity
X-Direction (Ex) : Positive Negative None
Y-Direction (Ey) : Positive Negative None

Torsional Amplification
 Accidental Eccentricity Inherent Eccentricity

Additional Seismic Loads (Unit:kN,m)

Story	Add.-X	Add.-Y	Add.-RZ

Seismic Load Profile... OK Cancel Apply

Added "Import" button (Activated when 'User Type')

[User Type]

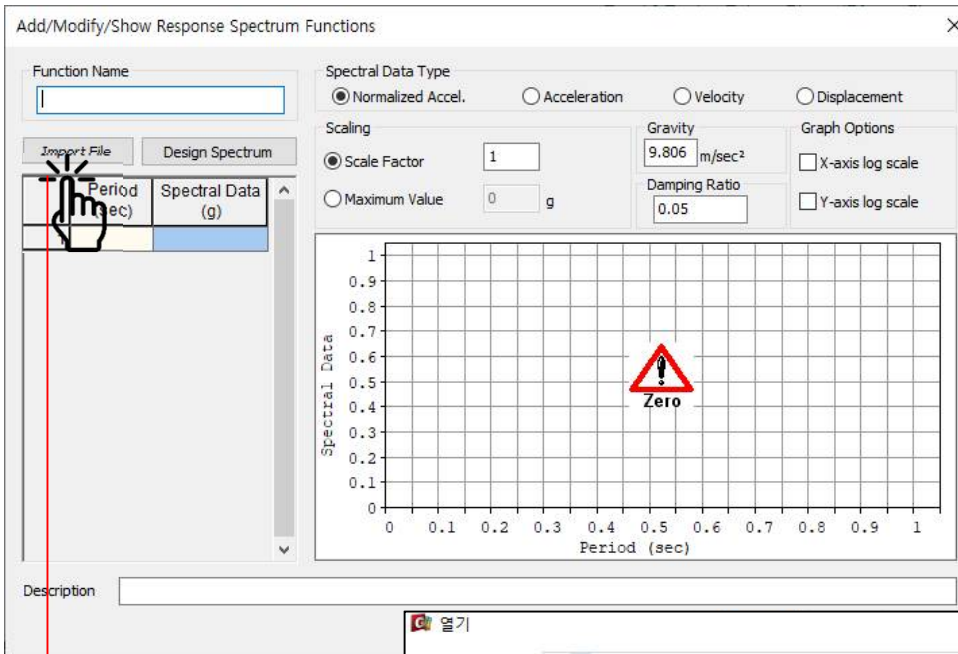
- We can generate these datas automatically (Story Name/Elev./Loaded H/ Loaded B)

[How to input the data]

1. Click "Import"
2. Select the excel file using API function. (NTCS2020.xlsm or MDOC2015.xlsm)
3. Modify excel data (refer to API Guide to input Mexico lateral loads)
4. Export the load to the midas Gen

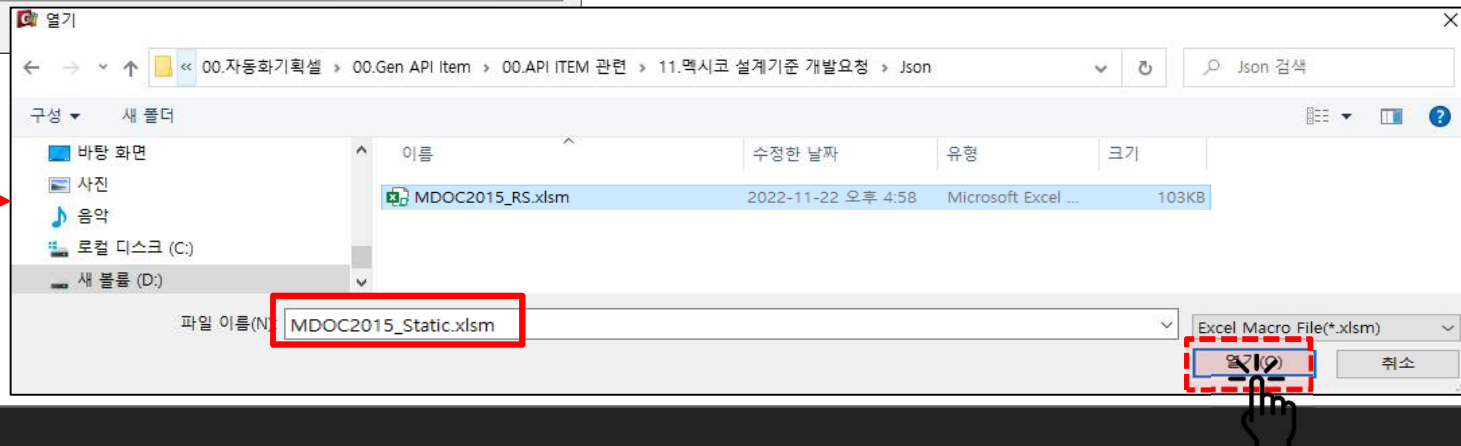
3. Mexican Seismic Load (Response Spectrum)

NTCS 2020 & MDOC 2015



[How to input the data]

1. Click "Import"
2. Select the excel file using API function.
(NTCS2020.xlsm or MDOC2015.xlsm)
3. Modify excel data
(refer to API Guide to input Mexico lateral loads)
4. Export the load to the midas Gen



4. Import Pushover Hinge Properties

Properties > Inelastic Properties > Inelastic Hinge > Import Pushover Hinge Properties

Hinge properties set in Pushover analysis can be imported to Inelastic Hinge Properties for the time history analysis.

Since Inelastic hinge properties are set before analysis, auto-calculation is not supported.

If the inelastic hinge properties are the same as the pushover's hinge properties, time history analysis can be performed quickly by bringing the automatically generated hinge properties.

Directional Properties of Inelastic Hinge : FEMA

Input Method
 Auto-Calculation
 User Input

Shape of FEMA Curve
 General Type
 Perfect Plastic Type

Strength Loss
 Yes
 No Figure

Type of I-End & J-End
 Symmetric
 Asymmetric

Unloading Stiffness Type
 Select Hyst. Model Origin-Oriented
 Energy Dissipation Factors & Unloading Stiffness Factor

Total Strength Loss at Point E, -E
Figure No

Properties

Type
 Symmetric Asymmetric

User Defined

	M/MY	D/DY
-E	-0.2	-25.756062200089
-D	-0.2	-15.146321257194
-C	-1.1	-15.146321257194
-B	-1	-1
A	0	A 0
B	1	B 1
C	1.1	C 15.146321257194
D	0.2	D 15.146321257194
E	0.2	E 25.756062200089

Yield Strength (MY)
 (+) (-)
 334.24831191; 334.24831191; kN·m

Yield Rotation (DY)
 User Defined
 (+) (-)
 0.0014137951; 0.0014137951; [rad]

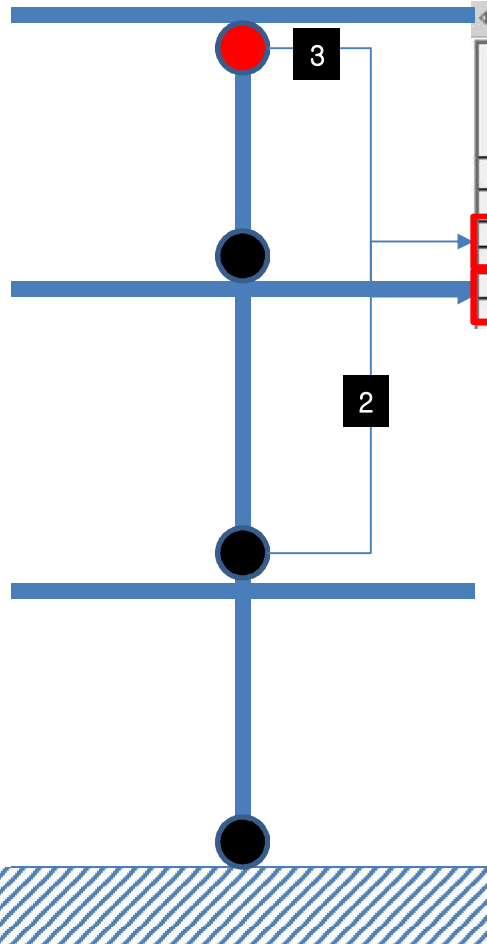
Acceptance Criteria
 (Current Deform./ Yield Deform.)

	(+)	(-)
Immediate Occupancy (IO)	4.5365803142985	4.5365803142985
Life Safety (LS)	8.0731606285970	8.0731606285970
Collapse Prevention (CP)	15.146321257194	15.146321257194

Initial Stiffness
 6EI/L 3EI/L 2EI/L
 User 0 kN/m
 Elastic Stiffness :

Primary Curve

5. Improvement for Joint Design (NTC 2018)



Beam-Column Joint Check for Existing Building

Elem	Position	Stress	Beam-Column Joint Check for Existing Building							
			y-axis				z-axis			
			Load	Demand (kN/m ²)	Capacity (kN/m ²)	Remark	Load	Demand (kN/m ²)	Capacity (kN/m ²)	Remark
Top means it was checked at the top position of the column. At this time, Vcol = 0.										
Press right mouse button and click 'Set Existing Joint Check Parameters' menu to change Load case/combination										
55	Bottom	Tensile	-	-	-	No Beams	-	-	-	No Beams
55	Bottom	Compressive	-	-	-	No Beams	-	-	-	No Beams
55	Top	Tensile	-	-	-	No Beams	cLCB8	3820.6700	1369.3000	NG
55	Top	Compressive	-	-	-	No Beams	cLCB8	6634.3800	10416.5000	OK

1. Delete "Check Position"
2. Basically Check the bottom of column.
3. In the case of under the roof (discontinuous columns without upper columns), the top is additionally reviewed. * Vcol = 0.

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

Appendix.

*API Guide to input
Mexico Lateral Loads*

Mexican seismic & wind load input using API

Seismic Load Code		Wind Load Code	
Mexico city	Other Districts	Mexico city	Other Districts
NTCS 2020	MDOC 2015	NTCS 2017	MDOC 2020
Seismic Static Load/ Response Spectrum		Static Wind Load	

Excel file for API : [\[Download\]](#)

- Seismic Static Load : NTCS 2020_Static.xlsm, MDOC 2015_Static.xlsm
- Response Spectrum : NTCS 2020_RS.xlsm, MDOC 2015_RS.xlsm
- Wind Static Load : NTCS 2017_Wind.xlsm, MDOC 2020_Wind.xlsm

Seismic Static Load

Added 'User Type' in the Seismic Load code.

Add/Modify Seismic Load Specification

Load Case Name : EX

Seismic Load Code : IBC2012(ASCE7-10) **Import**

Description : IBC2000(ASCE7-98)

Seismic Load Parameters

Design Spectral Response

Site Class : D

Ss : 0.75 Fa

S1 : 0.3 Fv

Period Coef. (Cu)

Risk Category

Seis. Design Category :

Structural Parameters

Analytical Period : Add 'User Type'

Approximate Period :

Fundamental Period :

Response Modification Factor (R)

Seismic Load Direction Factor

X-Direction : 1

Accidental Eccentricity

X-Direction (Ex) : Positive Negative None

Y-Direction (Ey) : Positive Negative None

Torsional Amplification

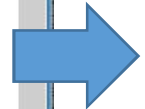
Accidental Eccentricity Inherent Eccentricity

Additional Seismic Loads (Unit:N,m)

Story	Add.-X	Add.-Y	Add.-RZ

Seismic Load Profile... **OK** Cancel Apply

Added "Import" button (Activated when 'User Type')



Add/Modify Seismic Load Specification

Load Case Name : EX

Seismic Load Code : User Type **Import**

Description :

	Story	Weight	Elev.	Seismic Force	
				X-Dir	Y-Dir
	Roof	1831.29	31.85	0	0
	8F	4646.47	25.8	0	0
	7F	2319.76	22.8	0	0
	6F	2267.92	19.8	0	0
	5F	2267.92	16.8	0	0
	4F	2299.56	13.8	0	0
	3F	2331.2	10.8	0	0
	2F	2331.2	7.8	0	0
	1F	2947.96	4.8	0	0
*	B1	4366.04	1	0	0

Seismic Load Direction Factor (Scale Factor)

X-Direction : 1 Y-Direction : 1

Accidental Eccentricity

X-Direction (Ex) : Positive Negative None

Y-Direction (Ey) : Positive Negative None

Torsional Amplification

Accidental Eccentricity Inherent Eccentricity

Additional Seismic Loads (Unit:kN,m)

Story	Add.-X	Add.-Y	Add.-RZ

Seismic Load Profile... **OK** Cancel Apply

'Activate "Import" button when 'User Type'

1. "Story Name/Weight/Elev." information is automatically filled (Read Only)
2. Seismic Force (x,y direction) is initial state (filled with 0.0). Real numbers can be entered (not read only)

Seismic Static Load

Seismic forces are inputted using the API.

Add/Modify Seismic Load Specification

Load Case Name : EX

Seismic Load Code : User Type

Description :

Story	Weight	Elev.	Seismic Force	
			X-Dir	Y-Dir
Roof	1831.29	31.85	6347.16	5898.87
8F	4646.47	25.8	13045.3	12124
7F	2319.76	22.8	5755.6	5349.09
6F	2267.92	19.8	4886.59	4541.46
5F	2267.92	16.8	4146.2	3853.36
4F	2299.56	13.8	3453.32	3209.42
3F	2331.2	10.8	2739.78	2546.28
2F	2331.2	7.8	1978.73	1838.98
1F	2947.96	4.8	1539.84	1431.08
B1	4366.04	1	475.117	441.56

Seismic Load Direction Factor (Scale Factor)

X-Direction : 1 Y-Direction : 1

Accidental Eccentricity

X-Direction (Ex) : Positive Negative None

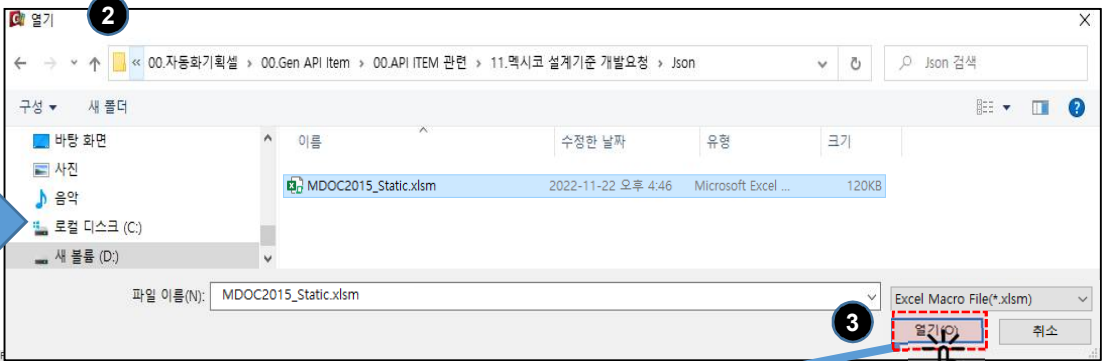
Y-Direction (Ey) : Positive Negative None

Torsional Amplification

Additional Seismic Loads (Unit:kN,m)

OK Cancel Apply

1,2. Click 'Import' button: Import Excel format



3. The API linked Excel file is opened

Seismic Load Parameter		
Parameter	Value	Unit
Importance Factor (Group)	1.0(B1)	-
Maximum Acceleration of rock layer (a0)	179.80	cm/s ²
Soil Type	III	-
Irregularity Correction Factor (α)	0.70	-
Damping Ratio (ζ)	0.015	-

Zone Parameter		
Parameter	Value	Unit
Seismic Zone	C	-
Site Factor (F _{st})	1.30	-
Response Factor (F _{res})	1.66	-
Response Factor (F _{res})	3.05	-
Dominant period (T _s)	2.00	sec

Structural Parameter		
Parameter	X-Dir	Y-Dir
Structural Period	0.5000 sec	0.5000 sec
Seismic Behavior Factor (Q)	3.00	3.00
Over-Strength Reduction Factor (R ₀)	2.00	2.00
Redundancy Factor (ρ)	0.80	0.80

Get Data Send Data Make Seismic Load Cal.Sheet

Story Name	Weight	Elev.	Wi*hi	Story Force(X)	Story Name	Weight	Elev.	Wi*hi	Story Force(Y)
Roof	1831.29	31.85	58326.59	6347.157916	Roof	1831.29	31.85	58326.59	5898.870575
8F	4646.47	25.8	119878.9	13045.34552	8F	4646.47	25.8	119878.9	12123.9783
7F	2319.76	22.8	52890.53	5755.600552	7F	2319.76	22.8	52890.53	5349.09275
6F	2267.92	19.8	44904.82	4886.587328	6F	2267.92	19.8	44904.82	4541.457226
5F	2267.92	16.8	38101.06	4146.195307	5F	2267.92	16.8	38101.06	3853.357647
4F	2299.56	13.8	31733.93	3453.318022	4F	2299.56	13.8	31733.93	3209.416928
3F	2331.2	10.8	25176.96	2739.782157	3F	2331.2	10.8	25176.96	2546.276705
2F	2331.2	7.8	18183.36	1978.731558	2F	2331.2	7.8	18183.36	1838.97762
1F	2947.96	4.8	14150.21	1539.839892	1F	2947.96	4.8	14150.21	1431.084015
B1	4366.04	1	4366.04	475.117222	B1	4366.04	1	4366.04	441.5602874

4. Input data from excel to Gen (via API)

Input Dialog :
Excel>"MDOC2015_Static"tab

Calculation of story (seismic) force based on Mexico Code :
Excel>"Static Seismic (MDOC2015)" tab (Hidden)

Seismic Static Load

Seismic forces are inputted using the API.

Add/Modify Seismic Load Specification

Load Case Name : EX
 Seismic Load Code : User Type
 Description :

Story	Weight	Elev.	Seismic F
Roof	1831.29	31.85	6347.16
8F	4646.47	25.8	13045.3
7F	2319.76	22.8	5755.6
6F	2267.92	19.8	4886.59
5F	2267.92	16.8	4146.2
4F	2299.56	13.8	3453.32
3F	2331.2	10.8	2739.78
2F	2331.2	7.8	1978.73
1F	2947.96	4.8	1539.84
B1	4366.04	1	475.117

Seismic Load Direction Factor (Scale Factor)
 X-Direction : 1 Y-Direction : 1

Accidental Eccentricity
 X-Direction (Ex) : Positive Negative
 Y-Direction (Ey) : Positive Negative

Torsional Amplification
 Accidental Eccentricity Inherent Eccentricity

Additional Seismic Loads (Unit:kN,m)

Story	Add.-X	Add.-Y	Add.-RZ

Seismic Load Profile... OK Cancel Apply

STATIC SEISMIC LOAD IN ACCORDANCE WITH MDOC2015

Seismic Load Parameter

Parameter	Value	Unit
Importance Factor (Group)	1.0(B1)	-
Maximum Acceleration of rock layer (a0)	179.50	cm/s ²
Soil Type	III	-
Irregularity Correction Factor (α)	0.70	-
Damping Ratio (ζ)	0.015	-

Zone Parameter

Parameter	Value	Unit
Seismic Zone	C	-
Site Factor (Fst)	1.38	-
Response Factor (Fres)	3.66	-
Response Factor (Fresb)	3.05	-
Dominant period (Ts)	2.00	sec

***If Soil Type is "I", Response Factor use "Fresb" value

Structural Parameter

Parameter	X-Dir	Y-Dir
Structural Period	0.5000 sec	0.6000 sec
Seismic Behavior Factor (Q)	3.00	3.00
Over-Strength Reduction Factor (R0)	2.00	2.00
Redundancy Factor (ρ)	0.80	0.80

Get Data Send Data Make Seismic Load Cal.Sheet

Input Dialog :
 Excel>"MDOC2015_Static"tab

1. When you click 'Get Data' button, 'Story, Weight, Elev.' data from Gen are delivered through API Server.
2. Using the previously obtained data, it can calculate the Story Force (Seismic Force) value in Excel.
3. When you click 'Send Data' button, 'Story Force' data from excel are delivered to Gen through API Server.

Story Name	Weight	Elev.	Wi*hi	Story Force(X)	Story Name	Weight	Elev.	Wi*hi	Story Force
Roof	1831.29	31.85	58326.59	6347.157916	Roof	1831.29	31.85	58326.59	5898.870575
8F	4646.47	25.8	119878.9	13045.34552	8F	4646.47	25.8	119878.9	12123.9789
7F	2319.76	22.8	52890.53	5755.600553	7F	2319.76	22.8	52890.53	5349.09375
6F	2267.92	19.8	44904.82	4886.587328	6F	2267.92	19.8	44904.82	4541.457226
5F	2267.92	16.8	38101.06	4146.195307	5F	2267.92	16.8	38101.06	3853.357647
4F	2299.56	13.8	31733.93	3453.318022	4F	2299.56	13.8	31733.93	3209.416928
3F	2331.2	10.8	25176.96	2739.782157	3F	2331.2	10.8	25176.96	2546.276795
2F	2331.2	7.8	18183.36	1978.731558	2F	2331.2	7.8	18183.36	1838.97762
1F	2947.96	4.8	14150.21	1539.839893	1F	2947.96	4.8	14150.21	1431.084015
B1	4366.04	1	4366.04	475.1168723	B1	4366.04	1	4366.04	441.5603974

2 Calculation of story (seismic) force based on Mexico Code :
 Excel>"Static Seismic (MDOC2015)" tab (Hidden)

Seismic Static Load

A calculation sheet for seismic and wind forces is provided.

- From 'Make Seismic Load Calc. Sheet' in Gen, the calculation results for stories are output.
- From 'Make Seismic Load Calc. Sheet' in excel, the inputted parameters are output.

Add/Modify Seismic Load Specification

Load Case Name : EX

Seismic Load Code : User Type

Import

STATIC SEISMIC LOAD IN ACCORDANCE WITH MD0C2015

Parameter	Value	Unit
Importance Factor (Group)	1.0(01)	-
Maximum Acceleration of rock layer (a ₀)	179.50	cm/s ²
Soil Type	III	-
Irregularity Correction Factor (α)	0.70	-
Damping Ratio (C)	0.015	-

Zone Parameter

Parameter	Value	Unit
Seismic Zone	C	-
Site Factor(Fsit)	3.00	-
Response Factor (Fres)	3.00	-
Response Factor (Fres)	3.00	-
Dominant period (Ts)	2.00	sec

***If Soil Type is "I", Response Factor use "Fresb" value

Structural Parameter

Parameter	X-Dir	Y-Dir
Structural Period	0.5000 sec	0.6000 sec
Seismic Behavior Factor (Q)	3.00	3.00
Over-Strength Reduction Factor (R0)	2.00	2.00
Redundancy Factor (p)	0.80	0.80

Get Data Send Data

Make Seismic Load Calc Sheet

Torsional Amplification

Accidental Eccentricity Inherent Eccentricity

Additional Seismic Loads (Unit:kN,m)

Story	Add-X	Add-Y	Add-RZ

Seismic Load Profile... OK Cancel Apply

STATIC SEISMIC LOAD IN ACCORDANCE WITH MD0C2015

Parameters	Unit	Remark
Seismic Zone	B	Table 1.3
Maximum Acceleration of rock layer(a ₀)	50	cm/s ²
Site Factor(Fsit)	3	Table 1.13
Response Factor(Fres)	4.2	Table 1.13
Damping Ratio, ζ	0.05	Table 3.1
Damping Factor, β	1	C.3.2.3
Irregularity Correction Factor(α)	0.90	C.3.3.2.4
Basic overstrength factor for X-direction(Rox)	2.50	C.3.3.1.3
Basic overstrength factor for Y-direction(Roy)	2.50	C.3.3.1.3
Seismic Behavior Factor for X-direction (Qx)	3.00	C.3.3.1.1
Seismic Behavior Factor for Y-direction (Qy)	2.00	C.3.3.1.1
Redundancy Factor for X-direction (px)	1.25	C.3.3.1.4
Redundancy Factor for Y-direction (py)	1	C.3.3.1.4
V0/Wt for X-direction(V0/Wt _x)	0.07611	Eq.3.8
V0/Wt for Y-direction(V0/Wt _y)	0.14271	Eq.3.8

Excel>"Make Seismic Load Calc.Sheet"
 Output from Excel(When clicking 'Make Seismic Load Cal.sheet' button, it is configured to output the calculation details through Excel VBA)

ECCENTRICITY RELATED DATA

STORY NAME	X - DIRECTIONAL LOAD				Y - DIRECTIONAL LOAD			
	ACCIDENTAL ECCENT.	INHERENT ECCENT.	ACCIDENTAL AMP. FACTOR	INHERENT AMP. FACTOR	ACCIDENTAL ECCENT.	INHERENT ECCENT.	ACCIDENTAL AMP. FACTOR	INHERENT AMP. FACTOR
Roof	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
12F	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
11F	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
10F	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
9F	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
8F	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
7F	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
6F	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
5F	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
4F	0.0	0.0	1.0	0.0	0.0	0.0	1.0	0.0
G.L.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

The accidental amplification factors are automatically set to 1.0 when torsional amplification effect to accidental eccentricity is not considered.
 The inherent amplification factors are automatically set to 1.0 when torsional amplification effect to inherent eccentricity is not considered.
 The inherent amplification factors are all set to 'the input value - 1.0'.(This is to exclude the true inherent torsion)

Product>"Make Seismic Load Calc. Sheet"
 Calculation with text format is outputted in midas Gen (excluding input parameters)
 Only the values related "story" are printed

STORY NAME	STORY HEIGHT	STORY LEVEL	SEISMIC FORCE	ADDED FORCE	STORY FORCE	STORY SHEAR	OVERTURN MOMENT	ACCIDENT. TORSION	INHERENT TORSION	TOTAL TORSION
Roof	1831.298	30.85	184.5457	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12F	2356.709	27.8	211.29	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11F	2319.762	24.8	187.9262	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10F	2319.762	21.8	165.1932	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9F	2267.924	18.8	139.2767	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8F	2267.924	15.8	117.0517	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7F	2267.924	12.8	96.14964	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6F	2331.205	9.8	74.52745	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5F	2331.205	6.8	51.78232	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4F	2347.964	3.8	36.59299	0.0	0.0	0.0	0.0	0.0	0.0	0.0
G.L.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SEISMIC LOAD GENERATION DATA Y-DIRECTION

COMMENTS ABOUT TORSION

File Name: D:\W00.2022년W00.자동화기획\W00.Gen API

Make Seismic Load Calc. Sheet

Browse

Ctrl + C

500.9016	343.2157
1029.506	777.295
454.2174	358.6683
385.6371	317.8662
327.2072	281.0334
272.5271	243.505
216.2167	200.6771
156.1565	150.34
121.5203	121.2012
37.49502	39.04093

Ctrl + V

Add/Modify Seismic Load Specification

Load Case Name : EX

Seismic Load Code : User Type

Description :

Story	Weight	Elev.	Seismic Force	
			X-Dir	Y-Dir
Roof	1831.29	31.85	500.901	343.215
8F	4646.47	25.8	1029.50	777.295
7F	2319.76	22.8	454.217	358.668
6F	2267.92	19.8	385.637	317.866
5F	2267.92	16.8	327.207	281.033
4F	2299.56	13.8	272.527	243.504
3F	2331.2	10.8	216.216	200.677
2F	2331.2	7.8	156.156	150.339
1F	2947.96	4.8	121.520	121.201
B1	4366.04	1	37.4950	39.0409
*				

Seismic Load Direction Factor (Scale Factor)

X-Direction : 1 Y-Direction : 1

Accidental Eccentricity

X-Direction (Ex) : Positive Negative None

Y-Direction (Ey) : Positive Negative None

Torsional Amplification

Accidental Eccentricity Inherent Eccentricity

Additional Seismic Loads (Unit:kN,m)

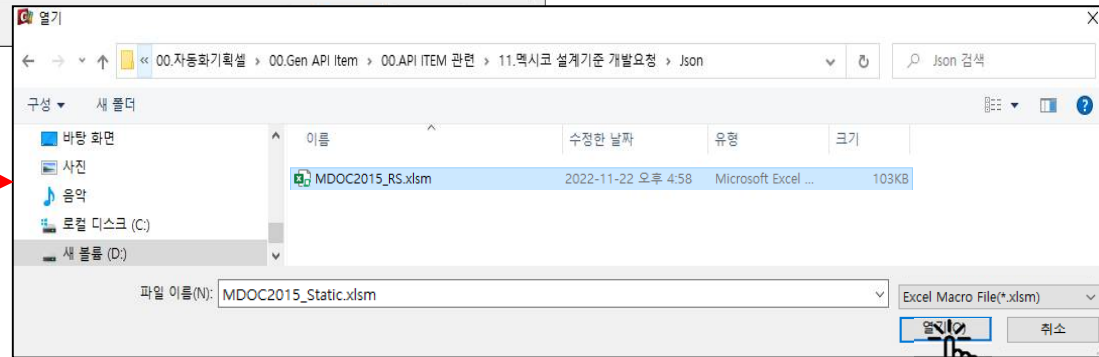
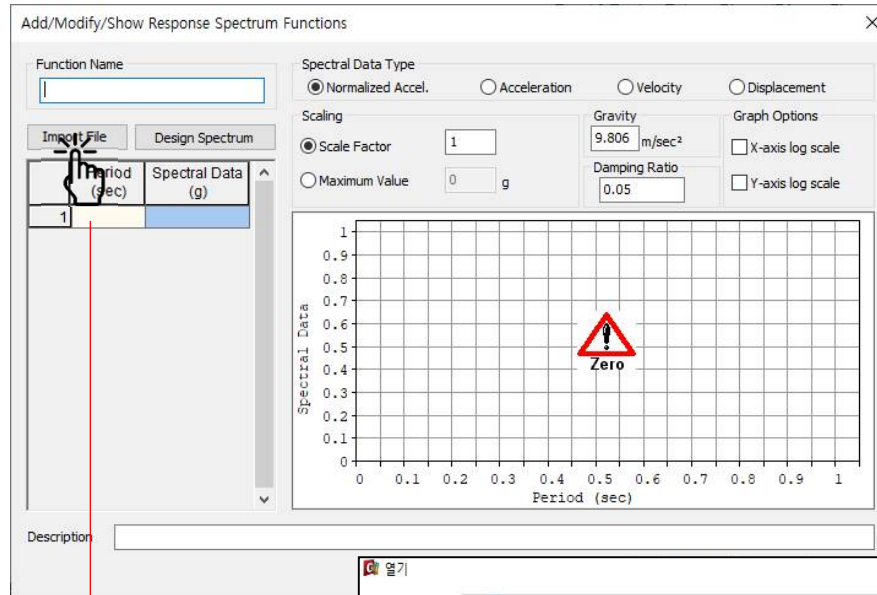
Story	Add.-X	Add.-Y	Add.-RZ

Seismic Load Profile... OK Cancel Apply

Even if you do not go through the API,
You can directly input the value of Excel through calculation into 'Seismic Force'.

Response Spectrum Function

Generate the response spectrum function using the API.



Response Spectrum Function

Generate the response spectrum function using the API.

3

GENERATE DESIGN SPECTRUM IN ACCORDANCE WITH NTC S2020

Function Name :

Seismic Load Paramter		
Parameter	Value	Unit
Importance factor(Group)	1.5(A1)	-
Maximum Acceleration of Soil (a0)	250.00	cm/s ²
Maximum Spectral Acceleration (c)	500.00	cm/s ²
Irregularity Correction Factor (α)	1.00	-
Maximum Displacement Quotient (k)	1.42	-
Damping Ratio (ζ)	5.0	%

Spectrum Parameters		
Parameter	Value	Unit
Characteristic Period (Ta)	0.20	sec
Characteristic Period (Tb)	0.40	sec
Dominant Period (Ts)	0.60	sec

Structural Paramter		
Parameter	Value	Unit
Seismic Behavior Factor (Q)	2.50	-
Hyperstacity Factor (k1)	1.25	-

Maximum Period		
Parameter	Value	Unit
Max. Period	6.00	sec

4 Create RS Data

- User actions include:
1. Click the "Import file" button.
 2. Open the file saved as *.xlsm.
 3. Enter the parameters to generate the load in excel.
 4. Click the 'Create RS Data' button.
 5. Check the function imported "Function Name/Period/Spectral data(g)".

Add/Modify/Show Response Spectrum Functions

Function Name:

Spectral Data Type: Normalized Accel. Acceleration Velocity Displacement

Scaling: Scale Factor Maximum Value

Scale Factor: Gravity: cm/sec²

Damping Ratio: Graph Options: X-axis log scale Y-axis log scale

Period (sec)	Spectral Data (g)	
1	0.0000	0.2391
2	0.0500	0.5991
3	0.1000	0.9381
4	0.1500	0.8829
5	0.2000	0.8338
6	0.2500	0.7900
7	0.3000	0.7505
8	0.3500	0.7147
9	0.4000	0.6822
10	0.4500	0.6526
11	0.5000	0.6254
12	0.5500	0.6004
13	0.6000	0.5773
14	0.6500	0.5559

5

Description:

OK Cancel Apply

Wind Static Load

Added 'User Type' in the Wind Load code.

Add/Modify Wind Load Specification

Load Case Name : WX

Wind Load Code : IBC2012(ASCE7-10) **Import**

Description :

Alternate Method

Wind Load Parameter

Basic Wind Speed : Eurocode-1(2005)
Eurocode-1(1992)

Exposure Category : BS6399(1997)

Mean Roof Height : KDS(41-10-15:2019)
KBC(2016)
KBC(2009)

Topographic Effects

Directional Factor : IS875(1987)
Taiwan(2002)
Japan(2004)

Gust Effect Factor : Japan(Arch.2000)
Japan(1987)

Load Evaluation : NSR-10
DPT.1331-50:2007
User Type

Force Coefficient :

Wind Eccentricity

X-Dir. (Wx) : Positive Negative None

Y-Dir. (Wy) : Positive Negative None

Wind Load Direction Factor (Scale Factor)

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

Additional Wind Loads (Unit:kN,m)

Story	Add.-X	Add.-Y	Add.-RZ

Wind Load Profile... OK Cancel Apply

Added "Import" button (Activated when 'User Type')

Add 'User Type'



Add/Modify Wind Load Specification

Load Case Name : WX

Wind Load Code : User Type **Import**

Description :

	Story	Elev.	Wind Pressure		Loaded H
			X-Dir	Y-Dir	
	Roof	31.85	0	0	3.025
	8F	25.8	0	0	4.525
	7F	22.8	0	0	3
	6F	19.8	0	0	3
	5F	16.8	0	0	3
	4F	13.8	0	0	3
	3F	10.8	0	0	3
	2F	7.8	0	0	3
	1F	4.8	0	0	3.4
	B1	1	0	0	2.7155

Wind Eccentricity

X-Dir. (Wx) : Positive Negative None

Y-Dir. (Wy) : Positive Negative None

Wind Load Direction Factor (Scale Factor)

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

Additional Wind Loads (Unit:kN,m)

Story	Add.-X	Add.-Y	Add.-RZ

Wind Load Profile... OK Cancel Apply

'Activate "Import" button when 'User Type'

1. "Story Name/Elev./Loaded H/ Loaded B" information is automatically filled (Read Only)
2. Wind Pressure (x,y direction) is initial state (filled with 0.0). Real numbers can be entered (not read only)

Wind Static Load

Wind forces are inputted using the API.

Add/Modify Wind Load Specification

Load Case Name : WX 1

Wind Load Code : User Type Import

Description :

Story	Elev.	Wind Pressure		Loaded H
		X-Dir	Y-Dir	
Roof	31.85	1104.93	1096.71	3.025
8F	25.8	1076.89	1068.88	4.525
7F	22.8	1060.78	1052.88	3
6F	19.8	1042.67	1034.91	3
5F	16.8	1021.98	1014.38	3
4F	13.8	997.748	990.321	3
3F	10.8	968.352	961.144	3
2F	7.8	959.303	959.162	3
1F	4.8	959.303	162	3.4
B1	1	959.303	2.162	2.7155

Wind Eccentricity

X-Dir. (Wx) : Positive Negative None

Y-Dir. (Wy) : Positive Negative None

Wind Load Direction Factor (Scale Factor)

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

Additional Wind Loads (Unit:N,m)

Story	Add.-X	Add.-Y	Add.-RZ

Wind Load Profile...

OK Cancel Apply

1.2. Click 'Import' button
: Import Excel format

열기

« 00.자동화기획설 > 00.Gen API Item > 00.API ITEM 관련 > 11.멕시코 설계기준 개발요청 > Json

구성 새 폴더

바탕 화면

사진

음악

로컬 디스크 (C:)

새 볼륨 (D:)

파일 이름(N): MDOC2020_Wind.xlsx 2

2022-11-22 오후 5:15 Microsoft Excel ... 192KB

Excel Macro File(*.xlsm)

열기(O) 3 취소

3. The API linked Excel file is opened.

WIND LOAD IN ACCORDANCE WITH

N Adjust to N, m as a

Wind Load Parameter

Parameter	Value	Unit
Terrain Category	V	
Regional Wind Speed (Vw)		
Topography Category (Pw)		
Windward Pressure Coef.	0.80	
Leeward Pressure Coef.	-0.60	
Building Height (H)	30.85	[m]

Consider Dynamic Effect Factor according to Chapter 5

Parameters for Dynamic Effect Factor

Parameter	Value	Unit
Along Wind Natural Frequency (n1)	1.00	[Hz]
Longitudinal Damping of Damping (ξ)	0.06	
Along Wind Breadth (b)	8.16	[m]
Along Wind Depth (d)	24.18	[m]

Show Dynamic Effect Factors

Results	Value	Unit
Reference Height (Za)	18.51	[m]
Mean Wind Velocity at Za (Vz)	36.39589254	[m/s]
Turbulence Length Scale at Za (Lz)	181.8666667	[m]
Turbulence Intensity at Za (Iz)	0.1622222	
Power Spectral Density (Suz)	0.1660776	
Power Spectral Density (Suz)	0.1660776	
Aerodynamic Admittance (Rz)	0.8020468	
Aerodynamic Admittance (Rz)	0.8020468	
Aerodynamic Variable (qz)	8.4789358	
Aerodynamic Variable (qz)	8.4789358	
Background Factor (B ⁺)		
Background Factor (B ⁺)	0.7468176	
Response Response Factor (R ⁺)	0.8776848	
Response Response Factor (R ⁺)	0.8776848	
Windcrossing Frequency (ν)	0.0776848	[Hz]
Peak Factor (g)	3.0	

Get Data Send Data Make Wind Load Cal.Sheet

4

4. Input data from excel to Gen (via API)

Story Nam	Level(m)	Frz	VD	Cp	qz(N/m ²)	Loaded	LoadedB	WindForc
Roof	30.85	0.91928144	38.3039323	1.3	122.62684	1.525	23.49	4392.76945
10F	27.8	0.90976129	37.9067107	1.3	120.1001295	3.025	23.49	8533.98493
9F	24.8	0.89943107	37.47631669	1.3	117.3883107	3	23.49	8272.35425
8F	21.8	0.88791369	36.9962224	1.3	114.3999445	3	23.49	8061.76412
7F	18.8	0.87486164	36.45251666	1.3	111.0621525	3	23.49	7826.54989
6F	15.8	0.85978266	35.82427754	1.3	107.2669504	3	23.49	7559.102
5F	12.8	0.84186794	35.07783082	1.3	102.84342	3	23.49	7247.37581
4F	9.8	0.82134	34.2225	1.3	97.8891408	3	23.49	6898.24775
3F	6.8	0.82134	34.2225	1.3	97.8891408	3	23.49	6898.24775
2F	3.8	0.82134	34.2225	1.3	97.8891408	3.4	23.49	7918.01412
1F	0	0.82134	34.2225	1.3	97.8891408	1.9	29.09	5410.4307
0F	0	0.82134	34.2225	1.3	97.8891408			0

Calculation of story(design wind) pressure based on Mexico Code (qz) :
Excel>" Dynamic Analysis(MDOC2020) " tab Or
Excel>"Static Analysis(MDOC2020 " tab (Hidden)

Input Dialog :
Excel>" MDOC2020_Wind"tab

Wind Static Load

Wind forces are inputted using the API.

Load Case Name : WX
 Wind Load Code : User Type
 Description :

Story	Elev.	Wind Pressure X-Dir	Wind Pressure Y-Dir	Load
Roof	31.85	1104.93	1096.71	3.
8F	25.8	1076.89	1068.88	4.
7F	22.8	1060.78	1052.88	
6F	19.8	1042.67	1034.91	
5F	16.8	1021.98	1014.38	
4F	13.8	997.748	990.321	
3F	10.8	968.352	961.144	
2F	7.8	959.303	952.162	
1F	4.8	959.303	952.162	
B1	1	959.303	952.162	2.7

Buttons: **1** Get Data, **3** Send Data, Make Seismic Load Cal.Sheet

STATIC SEISMIC LOAD IN ACCORDANCE WITH MDOC2015

Seismic Load Parameter		
Parameter	Value	Unit
Importance Factor (Group)	1.0(B1)	-
Maximum Acceleration of rock layer (a0)	179.50	cm/s ²
Soil Type	III	-
Irregularity Correction Factor (a)	0.70	-
Damping Ratio (ζ)	0.015	-

Zone Parameter		
Parameter	Value	Unit
Seismic Zone	C	-
Site Factor (Fst)	1.38	-
Response Factor (Fres)	1.66	-
Response Factor (Fresb)	3.05	-
Dominant period (Ts)	2.00	sec

***If Soil Type is "I", Response Factor use "Fresb" value

Structural Parameter		
Parameter	X-Dir	Y-Dir
Structural Period	0.5000 sec	0.6000 sec
Seismic Behavior Factor (Q)	3.00	3.00
Over-Strength Reduction Factor (R0)	2.00	2.00
Redundancy Factor (p)	0.80	0.80

1. When you click **'Get Data'** button, 'Story, Level, Loaded H, Loaded B.' data from Gen are exported through API Server.
2. Using the previously obtained data, it can calculate the **Wind Pressure**(Design Wind Pressure) in Excel.
3. When you click **'Send Data'** button, 'Design Wind Pressure' data from excel are delivered to Gen through API Server.

2

Story	Elev.	Loaded H	Loaded B	Wind Pressure	Wind Press
Roof	31.85	3.025	9.1	1104.930663	1096.70614
8F	25.8	4.525	9.1	1076.894797	1068.87896
7F	22.8	3	9.1	1060.776099	1052.88024
6F	19.8	3	9.1	1042.674681	1034.91350
5F	16.8	3	9.1	1021.982377	1014.37528
4F	13.8	3	9.1	997.7481315	990.321419
3F	10.8	3	9.1	968.3522652	961.14436
2F	7.8	3	9.1	959.3027172	952.162172
1F	4.8	3.4	9.1	959.3027172	952.162172
B1	1	2.7155	9.1	959.3027172	952.162172

Calculation of story(design wind) pressure based on Mexico Code (qz) :
 Excel>" Dynamic Analysis(MDOC2020) " tab Or
 Excel>"Static Analysis(MDOC2020 "tab (Hidden)

Input Dialog :
 Excel>" MDOC2020_Wind"tab

Wind Static Load

Support to paste data from excel

The image shows a software interface for defining wind loads. On the left, an Excel spreadsheet contains a table of data. A blue arrow points from this table to the 'Add/Modify Wind Load Specification' dialog box on the right. The dialog box has an 'Import' button highlighted. The data from the Excel spreadsheet is pasted into the dialog's table.

Excel Spreadsheet Data:

1104.930663	1096.70614
1076.894797	1068.878958
1060.776099	1052.880239
1042.674681	1034.913558
1021.982377	1014.375277
997.7481315	990.3214185
968.3522652	961.1443595
959.3027172	952.1621717
959.3027172	952.1621717
959.3027172	952.1621717
959.3027172	952.1621717
959.3027172	952.1621717

Add/Modify Wind Load Specification Dialog:

Case Name: WX
User Type: [Import]
Description:

Story	Elev.	Wind Pressure		Loaded H
		X-Dir	Y-Dir	
Roof	31.85	1104.93	1096.71	3.025
8F	25.8	1076.89	1068.88	4.525
7F	22.8	1060.78	1052.88	3
6F	19.8	1042.67	1034.91	3
5F	16.8	1021.98	1014.38	3
4F	13.8	997.748	990.321	3
3F	10.8	968.352	961.144	3
2F	7.8	959.303	952.162	3
1F	4.8	959.303	952.162	3.4
B1		959.303	952.162	2.7155

Wind Eccentricity:
X-Dir. (Wx): Positive Negative None
Y-Dir. (Wy): Positive Negative None

Wind Load Direction Factor (Scale Factor):
X-Dir. 1 Y-Dir. 1 Z-Rot. 0

Additional Wind Loads (Unit:N,m)

Story	Add.-X	Add.-Y	Add.-RZ

Buttons: Wind Load Profile..., OK, Cancel, Apply

Even if you do not go through the API, you can directly input the value of Excel through calculation into 'Wind Pressure'.