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Seismic and Building Code Consulting



Wind Simple

Version 2.3.0

User Manual

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DISCLAIMER

Every attempt has been made to ensure correctness in implementing code provisions as well as the accuracy of the calculations in Wind Simple. In using the program, the user accepts and understands that no warranty is expressed or implied by S. K. Ghosh Associates LLC or International Code Council to the accuracy or reliability of the program. The user must carefully read this manual and thoroughly understand the assumptions and limitations of this software. The user must independently verify the results of Wind Simple, and in no event shall S. K. Ghosh Associates LLC or its employees or affiliates be held liable for any indirect, incidental, consequential, or punitive damages whatsoever relating to the use of Wind Simple.



REVISION HISTORY

Version 1.0.0 (Release Date: 2012)

1. Initial Release of Wind Simple.

Version 2.0.0 (Release Date: December 16, 2019)

1. Addition of ASCE 7-16 design code.
2. Addition of visual aids.
3. Improvements on the user interface design and functionality.
4. Calculating MWFRS pressure values in both longitudinal and transverse directions.

Version 2.1.0 (Release Date: February 11, 2020)

1. Corrected an error where the MWFRS wall pressure values for transverse wind direction were not being printed on the output report.
2. Corrected an error where roof pressures in Zone 1 and Zone 2 were being incorrectly displayed as “NA” for roof angles between 9.46° and 14°.
3. Made changes and corrections in how the MWFRS overhang pressures are displayed.
4. Resolved an issue where the forms displaying parapet and overhang pressures for Gable and Mansard roofs did not display any output after they were closed and reopened.

Version 2.2.0 (Release Date: December 3, 2020)

1. Corrected an error where the program was unable to produce an output report when ASCE 7-10 was selected as the design code and overhangs and/or parapets were present.

Version 2.3.0 (Release Date: February 19, 2021)

1. Corrected an error where the C&C parapet pressure was being determined at the mean roof height instead of at the top of the parapet.
2. Wind pressure database has been updated based on the errata to ASCE 7-16.

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SYMBOLS AND ACRONYMS

B	Horizontal dimension of building measured normal to wind direction.
h	Mean roof height of building
h_e	Roof eave height
h_p	Parapet height measured from the base of the building
H	Height of hill, ridge or escarpment
K_{zt}	Topographic factor
$K_{zt,roof}$	Topographic factor at roof height
$K_{zt,wall}$	Topographic factor at specific wall height or at $0.33h$
$K_{zt,parapet}$	Topographic factor at parapet height
K_1, K_2, K_3	Multipliers to obtain K_{zt}
L	Horizontal dimension of building measured parallel to wind direction.
L_h	Distance upwind of crest of hill, ridge, or escarpment to where the difference in ground elevation is half the height of the hill, ridge or escarpment
p_h	Net wall pressure in the direction of wind at the mean roof height of building
p_0	Net wall pressure in the direction of wind at the base of building
V	Basic wind speed
x	Distance upwind or downwind from crest



ABOUT WIND SIMPLE

Intended Audience

Wind Simple software and this attached software documentation is intended to be used by engineers, architects and other experienced designers. This document is to be used jointly with the software to calculate wind load pressures applied on structures.

System Requirements

- **Software:** Microsoft .NET Framework 4.6.1
- **Processor:** AMD Athlon, Intel Pentium or equivalent – 1 GHz minimum
- **Memory:** 512 MB minimum
- **Hard Drive:** 1 GB
- **Operating System:** Windows XP/Vista/7/8/10 (32 or 64 bit)
- **Additional Requirements:** Internet Connection

SOFTWARE OVERVIEW

WIND SIMPLE – WIND LOAD CALCULATION SOFTWARE

Wind Simple is an intuitive computer program that implements the simplified directional procedure included in ASCE 7-10 and ASCE 7-16 that applies to enclosed buildings having a mean roof height up to 160 ft that meet the limitations in Part 2 of Chapter 27 in ASCE 7 for main wind-force resisting systems (MWFRS) and Part 4 of Chapter 30 for component and cladding (C&C). Wind Simple takes the design pressures from the applicable tables and sections within ASCE 7, automates the multiple interpolations that are involved, calculates the required adjustment factors, and provides all the results in a series of clear and simple tables and colorful illustrations. Wind Simple is designed to calculate MWFRS and C&C pressures on walls and roofs, parapets, roof overhangs and wind forces at each floor level.

Additional features of Wind Simple:

- Provides option to include the effects of the internal pressure on the MWFRS wall pressures.
- Calculates MWFRS wind forces on different floor levels
- Applies the effective area reduction factor for C&C pressures.
- Calculates the topographic effect factor, K_{zt} .
- Provides feedback on user input values promptly with tips and messages.
- Documents the calculations in clear PDF report.

Software Operation

Actions can be initiated, and data can be entered and edited in Wind Simple using the both the mouse and keyboard. With the mouse, initiate an action by clicking on the appropriate control. With the keyboard, use the tab key to navigate through the controls until the one you want is selected, and use the enter key to initiate the action.

Command and option objects can be either enabled or disabled. If enabled the, the color is dark and distinct. If disabled, the text or icon is dimmed and grayed. If an object is disabled it means the action associated with that object is not functional at that time.

Software Design Limitations and Assumptions

1. Where the input design wind speed, V , is not listed in the pressure tables included in ASCE 7, the corresponding pressure value is determined by performing a linear interpolation based on V^2 . This is because, wind pressure is proportional to the square of wind speed.
2. Internal pressure for a building's main wind-force resisting system is calculated only when the user selects the relevant option. According to ASCE 7, the internal pressure is equal to $q_h(GC_{pi})$, where GC_{pi} for enclosed buildings is ± 0.18 . q_h is calculated using the Directional Procedure in Part 1 of Chapter 27 of ASCE 7. Positive internal pressure is applied to the leeward and side wall pressures as determined from Table 27.6-1 to get the total pressures on the walls. Negative internal pressure is applied to the windward wall pressure.

3. Wall pressures for the main wind-force resisting system do not include any pressure from parapet or any horizontal component of roof pressure.
4. According to section 30.2.3, component and cladding elements with tributary area greater than 700 ft² can be designed using the main wind-force resisting system (MWFRS) provisions. This exception is not considered in Wind Simple at this time.
5. Regarding the distribution of MWFRS parapet pressure to windward and leeward parapets:
In the Directional procedure from Chapter 27 Part 1, parapet pressures are determined according to Section 27.4.5. In this method $GC_{pn} = +1.5$ for the windward parapet and $GC_{pn} = -1.0$ for the leeward parapet. In the simplified Directional Procedure from Part 2 of Chapter 27, the combined pressure on the windward as well as the leeward parapets is given as 2.25 times p_h from Table 27.6-1 for $L/B = 1.0$ evaluated at h_p , the height at the top of the parapet. Section 27.6.2 does not provide pressures on the two parapets separately. Therefore, a ratio of the windward parapet pressure to the leeward parapet pressure is as assumed to be 1.5 based on the same ratio used in Chapter 27 Part 1.
6. p_s values given for components and cladding pressures on the soffits of roof overhangs include the reduction coefficients that apply to the wall pressures on which the p_s value is based.
7. Minimum design wind loads for the main wind-force resisting system stipulated in Section 27.1.5 of ASCE 7 are not considered in Wind Simple. The required minimum design wind loads are to be considered as a separate load case by the user.
8. Minimum design wind pressures stipulated in Section 30.2.2 of ASCE 7 for components and cladding are not considered in Wind Simple. User needs to consider this separately.
9. Unless Topographic Factor K_{zt} values are defined by the user:
 - a. K_{zt} value for determining wall pressures is calculated at $0.33h$.
 - b. K_{zt} value for determining roof pressures and overhang pressure is calculated at h .
 - c. K_{zt} applied to parapet pressures is determined at parapet height, h_p .

SOFTWARE LAYOUT

Wind Simple General Layout

Wind Simple software window contains two bars and a working panel as shown in Figure 2.1 below. Wind Simple operation is controlled mainly by the **Tool Bar** commands, while familiar program commands and other additional helpful tools could be found under the submenus in the **Menu Bar**. The **Workspace** is the main interface of the program; it contains the input panel to which the user will enter the project data before analysis, and the results tabs for both main wind-force resisting system and component and cladding.

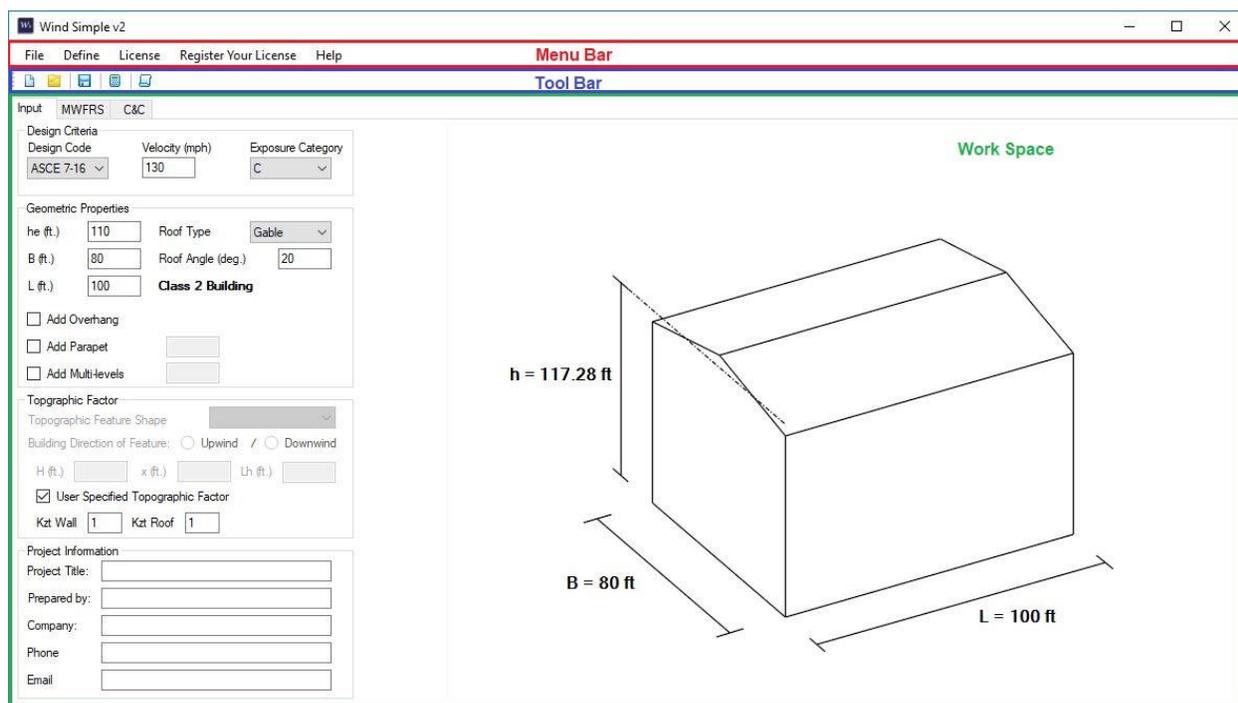


Figure 2.1. Wind Simple v2 Main Interface

Menu Bar

The **Menu Bar** is the topmost bar under the title in the program window. The **Menu Bar** contains submenus that each provides familiar options needed by the user to control software operations.

<u>Submenu</u>	<u>Item</u>	<u>Description</u>
File	New Project	starts a new project at any instant.
	Open	allows the user to open an existing project.
	Save	saves the existing project.
	Save As	allows the user to save the current project as a new project.
	Exit	closes the program window.

Define	Default Values	saves the current input values in the workspace as default. Every time the program is launched, it would open with the default values.
License	Activate	activates the program license if a free license is available.
	Deactivate	deactivates the program license and frees up the license for others to use.
	Reset License	resets the program license so that users can transition from trial mode to fully licensed mode, or renew license
Register Your License		opens a new window which allows the user to register a purchased license to the server.
Help	Documentation	redirects the user to the User Manual that comes along with the software.
	Check for Updates	allows the user to check for the latest released version of the software.
	About	opens a new window that contains the general information about the software and the copyrights.

Tool Bar

The **Tool Bar** is located below the **Menu Bar** at the top of the window. It consists of familiar windows command buttons and comprises of the major commands provided by the software.

The following actions can be initiated from the tool bar:

	New Project: this button allows the user to start a new project at any instant.
	Open Project: this button allows the user to open an existing project. Once the project is open the analysis will be run automatically.
	Save: this button enables the user to save the existing project.
	Calculate: clicking on this button will run the analysis. Once the analysis is complete the program will move to the results panel in the workspace area of the program interface.
	Report: this button will generate a report in PDF format comprising of all the results that the program generates.

Workspace

The workspace contains three tabs: An **Input** tab and two results tabs, **MWFRS** and **C&C**. Each tab is then split to two panels: an input panel or an output panel on the left side, and a picture box on the right side.

- Input Panel
The input panel is the main interface of the program and is located on the left side of the **Input** tab. This panel includes interactive objects that allow the user to enter all data required to determine wind pressure values for the main wind-force resisting system and components and cladding of the building. (Refer to Chapter 3 for a comprehensive description of the panel.)

- Results Panel
The results panel is located on the left side of the **MWFRS** or **C&C** tabs. Under the **MWFRS** Tab, the panel contains result tables for pressure values applied on the main wind-force resisting system in both longitudinal and transverse directions. Under the **C&C** tab, the panel shows pressure values for all component and cladding zones. Parapet and overhang pressure values are also shown in tables in the results panel for both MWFRS and C&C. (Refer to Chapter 4 for a comprehensive description of the panel.)

- Picture Box
The picture box is located at the right side of each tab. The box shows an isometric view of the building based on the geometric properties provided by the user. The image is updated automatically as the user changes the building dimension and roof properties in the **Input** tab. The building dimensions are also shown on the figure for reference.

In the results tabs, **MWFRS** and **C&C**, the figure also illustrates the pressure zones for each roof type as applicable per the selected design building code. The zone areas are color coded to match the zone numbers in the pressure tables of the results panel. The building dimensions are replaced by the dimensions of zone areas.

Note, the picture is edited to fit the program window, that may alter the quality and scale of the image.

INPUT

The input tab is split to two panels, a data input panel on the left and picture box on the right, as shown in Figure 3.1.

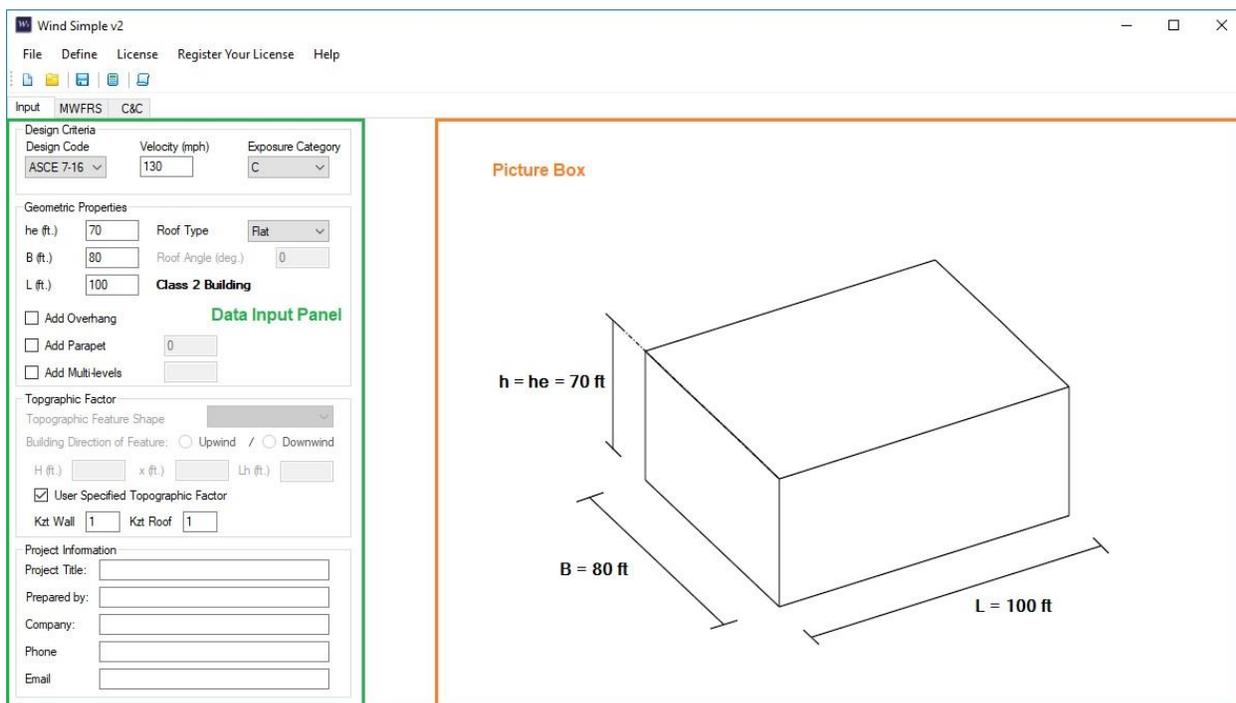
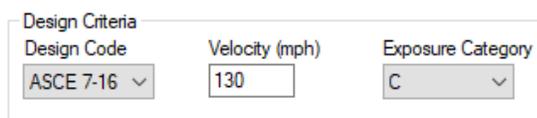


Figure 3.1. Wind Simple v2.0 Input Tab

User Input

The user must input all required data before running the analysis. The data input panel is split into four distinct regions: **Design Criteria**, **Geometric Properties**, **Topographic Factor**, and **Project Information**, that are arranged in a simple sequence suited for everyday user.

- a. **Design Criteria** is the first region on the panel, and it contains the general information needed for the project analysis, including the Design Code, Wind Speed (V), in mph, and the building exposure category. The Design Code drop-down list allows the user to select between ASCE 7-10 and ASCE 7-16. The wind speed is entered manually by the user into a text box in miles per hour. Lastly, the exposure category is selected from the list as either B, C, or D.



- b. **Geometric Properties** section contains input related to building geometry:

Geometric Properties

he (ft.) Roof Type

B (ft.) Roof Angle (deg.)

L (ft.) **Class 2 Building**

Add Overhang

Add Parapet

Add Multi-levels

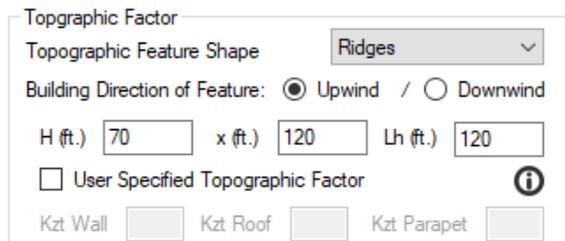
- i. **Building Dimensions:** the user enters roof eave height, h_e , and rectangular base dimensions, L and B in feet. The roof type is selected from a drop-down list and roof angle is entered in degrees. If the selected roof type is Flat, the roof angle is automatically set to zero and the roof angle text box is deactivated.
- ii. **Overhang:** to calculate overhang pressure [Add Overhang] needs to be checked.
 Add Overhang
- iii. **Parapet:** to calculate parapet pressure checkbox [Add Parapet] needs to be checked and parapet height, h_p , entered to the adjacent textbox in feet.
 Add Parapet hp (ft.)
- iv. **Floor Level Force:** check [Add Multi-levels] to calculate forces at each floor. Enter the number of floors in the adjacent box then click on the button [Edit Heights] to edit each level height if needed.
 Add Multi-levels

When [Edit Heights] is clicked a new window appears containing a two column table. The first column shows the total height at each floor, z . The second column shows roof height of each floor. Initially, the story height of each floor is set equal for all floors by dividing the mean roof height by the number of floors. To edit a story height, **left click with your mouse** on the box of the floor to be edited => **enter the new value** => **press <Enter>** on the keyboard. The total height, z , at each floor is automatically updated.

Multi-level Heights

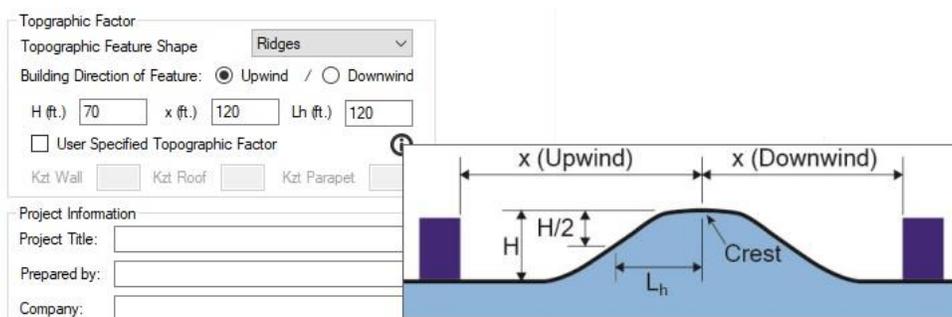
	Height, z (ft.)	Story Height (ft.)
	0	0
	10	10
	20	10
▶	30	10
	40	10
	50	10
	60	10
	70	10

- c. **Topographic Factor** section is dedicated for topographic factor, K_{zt} , calculation. The topographic factor could be either calculated by program or entered explicitly by the user for the roof, walls, and parapet, if applicable.



To calculate the topographic factor by the program:

1. Select the feature type from the [Topographic Feature Shape] drop-down list.
2. Select whether the building is upwind or downwind of the feature.
3. Enter the values for the parameters that define the geometry of the feature, H , x , and L_h in feet. For the illustration of the topographic feature shape and definition of its properties, hover the mouse over the information help icon ⓘ and an explanatory figure will pop up for the selected feature, as shown below.



To enter topographic values manually by the user, check the [User Specified Topographic Factor] checkbox then enter the topographic factor for walls and roof. If [Add Parapet] checkbox in the **Geometric Properties** section is checked, an additional textbox will appear to enter K_{zt} value at parapet height.

- d. **Project Information** is the last section in the input panel, and it contains the project information including Project Title, Project Engineer, Company name, and contact information. The information entered in this section is for formal use in the results report heading and is not mandatory for running the analysis.

Validation of Input

The software checks all user input for validity instantly as data is entered. A red label indicates an error that needs to be adjusted before running the analysis. Warnings and error messages are also shown in red in the input panel (see example figure below).

Input errors include and are not limited to:

1. A mandatory input not provided.
2. A positive value that is set to zero.
3. An input value that does not comply with the requirements of the selected design criteria.

Geometric Properties

he (ft.) Roof Type

B (ft.) Roof Angle (deg.) ≤ 45

L (ft.) L/B Ratio should not be less than 0.5 nor more than 2.0

Add Overhang

Add Parapet hp (ft.) \leq h (ft.)

Add Multi-levels

Roof Angle must be less than 45 degrees.

The entered dimensions do not meet the requirements for the method applicability.

Entered parapet height is less than the mean roof height, h.

OUTPUT

The results section shows the calculated pressures for the main wind-force resisting system and components and cladding on separate tabs. After running the analysis, choose between **MWFRS** and **C&C** tabs to see the results. In this chapter, the interface of both tabs is explained.

Main Wind-Force Resisting System

Wind Simple provides the design wind pressures on the building for both wind directions, longitudinal and transverse. Therefore, the analysis only needs to be run one time. The results are presented with the assumption that the topographic effects and exposure are the same in both directions.

To see the results of MWFRS, click on MWFRS tab.

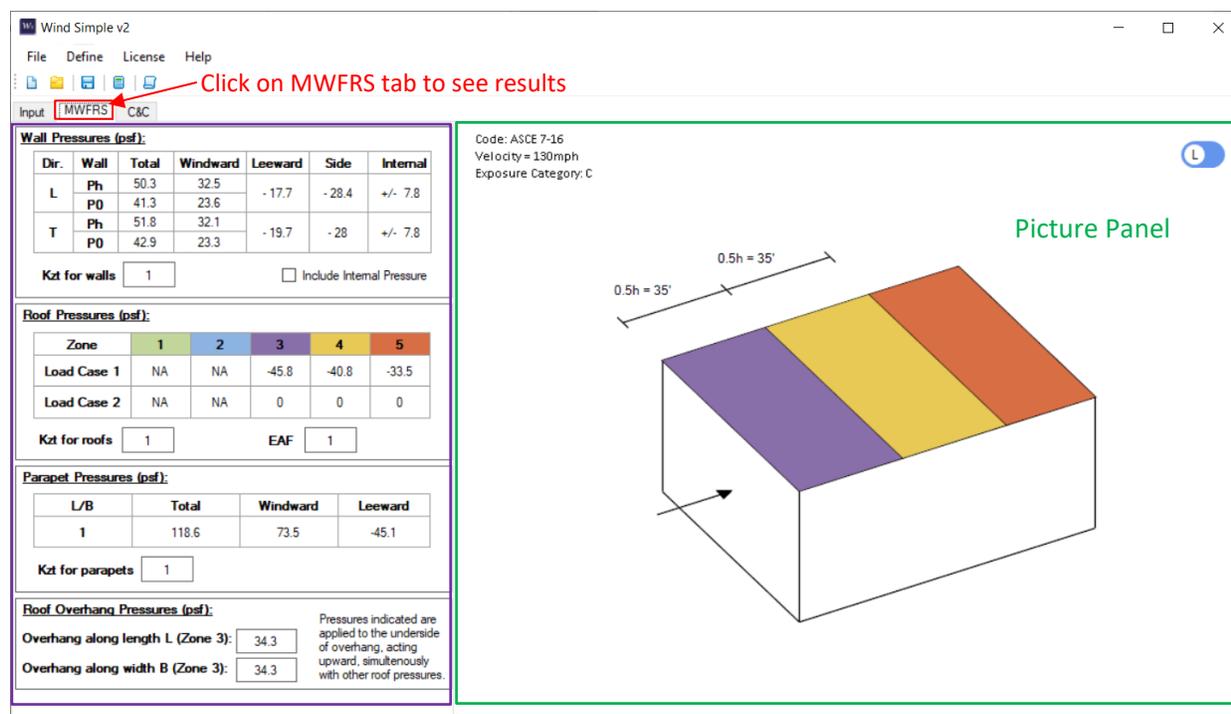


Figure 4.1. Wind Simple v2 MWFRS Tab

The tab is split to two panels, a results panel and a picture box. The results panel contains a series of tables for Wall Pressures, Roof Pressures, Parapet Pressure, and Roof Overhang pressure. The picture box illustrates the structure under analysis with colored roof pressure zone areas.

Wall Pressure

Wall pressure table provides the total, windward, leeward and side wall pressures at both building ground level, P_0 , and mean roof height, P_h , in both longitudinal and transverse wind directions. Leeward and side wall pressures are constant along the height of the building and are set equal in a merged cell between P_0 and P_h .

Wall Pressures (psf):

Dir.	Wall	Total	Windward	Leeward	Side
L	Ph	57.7	38.1	-19.5	-33.3
	PO	44.2	24.7		
T	Ph	60.2	37.3	-22.9	-32.5
	PO	47	24.1		

Kzt for walls Include Internal Pressure

To include internal pressure in the windward and leeward wall pressures, check the box [Include Internal Pressure] to the bottom right of the table. Note when the internal pressure is included, the pressures on the windward and leeward walls will not add up to the net pressure.

Wall Pressures (psf):

Dir.	Wall	Total	Windward	Leeward	Side	Internal
L	Ph	57.7	46.6	-28	-41.8	+/- 8.5
	PO	44.2	33.1			
T	Ph	60.2	45.8	-31.4	-41	+/- 8.5
	PO	47	32.6			

Kzt for walls Include Internal Pressure

Check box to include internal pressure.

To see pressure values and forces at each floor level, click on [Levels Forces] button. Once clicked a new window will open with a six-column table showing the net, windward, leeward, side pressures and total force at each floor height.

Wall Pressures (psf):

Dir.	Wall	Total	Windward	Leeward	Side
L	Ph	57.7	46.6	-28	-41.8
	PO	44.2	33.1		
T	Ph	60.2	45.8	-31.4	-41
	PO	47	32.6		

Kzt for walls Include Internal Pressure

Click on the button to see pressure values at each level

Floor Level Pressures and Forces

Height, z (ft.)	Net Pressure (psf)	Windward Pressure (psf)	Leeward Pressure (psf)	Sidewall Pressure (psf)	Total Force (kips)
0	44.2	33.13	-28.01	-41.78	17.81
10	45.48	34.41	-28.01	-41.78	36.38
20	46.76	35.69	-28.01	-41.78	37.41
30	48.04	36.97	-28.01	-41.78	38.43
40	49.31	38.25	-28.01	-41.78	39.45
50	50.59	39.53	-28.01	-41.78	40.47
60	51.87	40.81	-28.01	-41.78	41.5
70	53.15	42.08	-28.01	-41.78	42.52
80	54.43	43.36	-28.01	-41.78	43.54
90	55.71	44.64	-28.01	-41.78	44.57
100	56.99	45.92	-28.01	-41.78	47.25

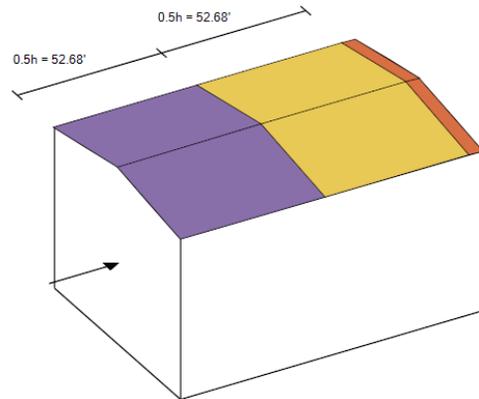
Internal Pressure: +/- 8.47 psf
 Include Internal Pressure
 Wind Direction: Longitudinal Transverse

Roof Pressure

The roof pressure table in MWFRS has two rows and multiple columns. Each row represents pressure values for a load case, 1 or 2, while each column is dedicated for roof pressure values for a specific pressure zone determined according to the design code. The column heading cells are color coded to match the colored roof zones in the adjacent figure. The pressure values for each zone must be applied according the zone dimensions shown in the building illustration.

Roof Pressures (psf):					
Zone	1	2	3	4	5
Load Case 1	-47	-33.1	-49.8	-44.5	-36.5
Load Case 2	8.6	-10.9	0	0	0

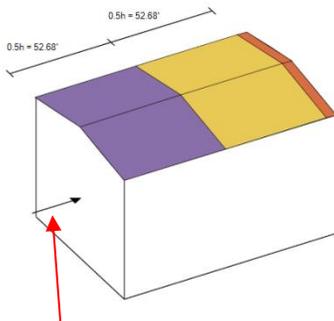
Kzt for roofs EAF



For the roof pressures of the main wind-force resisting system, Load Case 1 represents the maximum suction on the roof surface, and load Case 2 represents the minimum suction or maximum positive pressure on the roof surface. In this table a positive pressure is applied toward the surface and a negative pressure (suction) has a direction away from the surface.

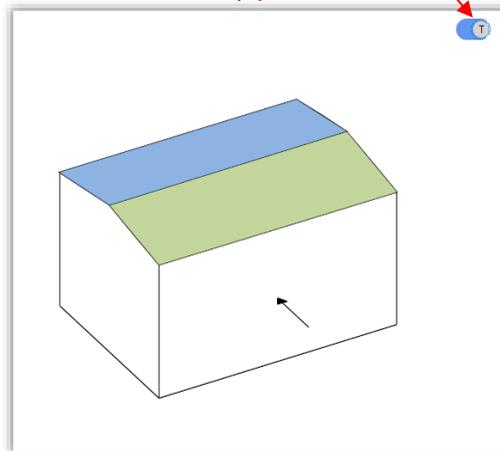
To switch between longitudinal and transverse wind directions, click on the button located at the top left corner of the picture box.

Code: ASCE 7-16
Velocity = 130mph
Exposure Category: C



Arrow indicates wind direction.

Click to switch wind directions between longitudinal (L) and transverse (T).



Parapet Pressure

Parapet pressures are calculated and included in the results only when the [Add Parapet] checkbox in the **Input** tab is checked.

The total column shows the effect of horizontal wind loads applied to all vertical surfaces of roof parapets. The pressure to be applied to the projected area of the parapet surface is equal to 2.25 times the tabulated wall pressures obtained for $L/B = 1.0$ using a height equal to h_p . The ratio of the windward parapet pressure to the leeward parapet pressure is taken as 1.5 and the pressure on each parapet is calculated based on this ratio and indicated in the table.

Parapet Pressures (psf):			
L/B	Total	Windward	Leeward
1	134.8	83.6	-51.2

Kzt for parapets

Roof Overhang Pressure

Roof overhang pressures are calculated and included in the results only when the [Add Overhang] checkbox in the **Input** tab is checked before analysis.

The values of the overhang pressure, P_{ovh} , are determined according to design code. The pressures are applied to the underside of the roof overhang in addition to the negative roof edge pressures. A positive pressure acts towards the underside of the overhang surface. This pressure acts upward and adds to the negative roof pressures on the top of the overhang. P_{ovh} is taken as 75% of the negative roof edge pressure. The negative roof pressure for the overhang along the length L of the building corresponds to the Zone 1 roof pressure (transverse wind) and that for the overhang along the width B of the building corresponds to the Zone 3 of the roof pressure (longitudinal wind) [except that for Hip roofs, all overhangs are governed by Zone 1 pressure, and for Flat roofs, all overhangs are governed by Zone 3 pressure].

Roof Overhang Pressures (psf):		Pressures indicated are applied to the underside of overhang, acting upward, simultaneously with other roof pressures.
Overhang along length L (Zone 1):	<input type="text" value="33.7"/>	
Overhang along width B (Zone 3):	<input type="text" value="34.3"/>	

Component and Cladding

To see the results of component and cladding pressures, click on **C&C** tab.

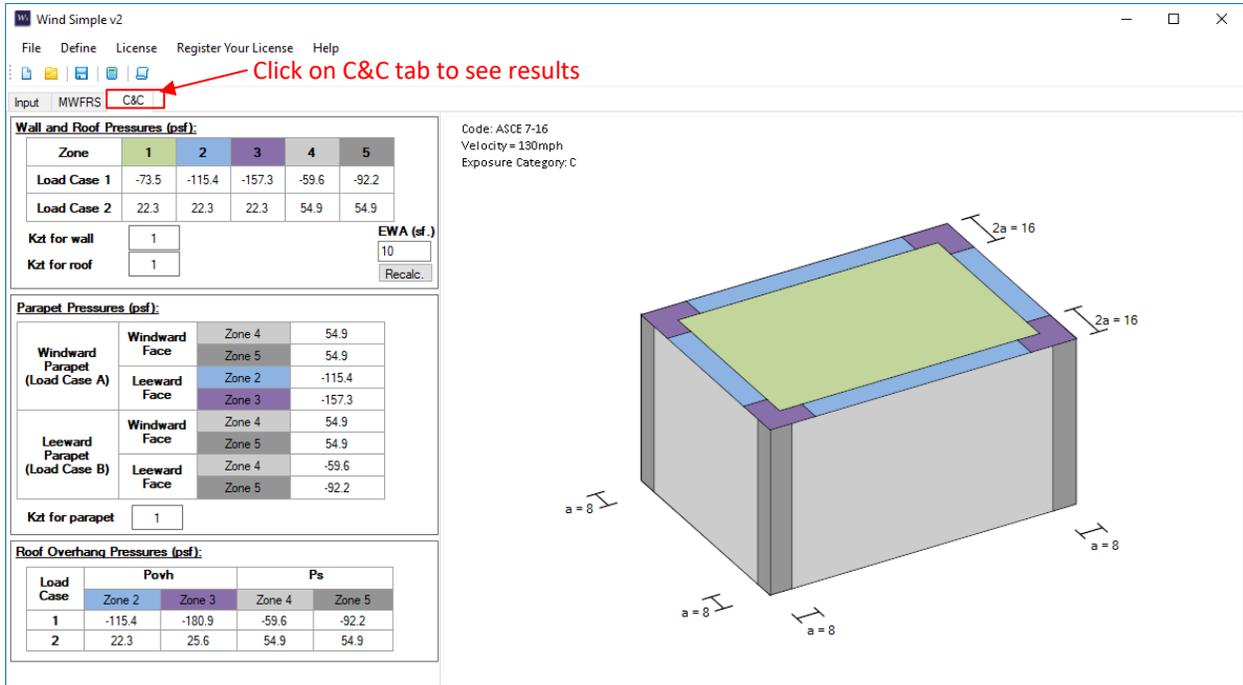


Figure 4.2. Wind Simple v2 C&C Tab

The tab is split to two panels, a results panel and a picture box. The results panel contains a series of tables for Wall and Roof Pressures, Parapet Pressure, and Roof Overhang pressure. The picture box illustrates the structure under analysis with colored pressure zone areas.

Wall and Roof Pressures

The wall and roof pressure table in C&C has two rows and multiple columns. The two rows display the pressure values for Load Cases 1 and 2, while each column displays a specific roof zone. The column heading cells are color coded to match the colors of the roof zones shown in the adjacent figure. The pressure values for each zone are applied according the zone color and dimensions shown in the adjacent building illustration.

For the components and cladding, Load Case 1 represents maximum suction (negative pressure). Load Case 2 represents maximum pressure applied toward the surface (positive pressure).

Wall and Roof Pressures (psf):					
Zone	1	2	3	4	5
Load Case 1	-73.5	-115.4	-157.3	-59.6	-92.2
Load Case 2	22.3	22.3	22.3	54.9	54.9

Kzt for wall: EWA (sf.):
 Kzt for roof:



The wall and roof pressures are calculated for an effective wind area of 10 by default. To calculate the C&C pressure values for different areas, enter the value to [EWA] text box then left click on the button [Recalc.]. The software will recalculate the pressure values based on the newly entered effective wind area and automatically update all results tables.

Parapet Pressure

Parapet pressures are calculated and included in the results only when the [Add Parapet] checkbox is checked before analysis.

Component and cladding pressures are based on the wind pressures for the applicable interior, edge, or corner zones adjacent to the parapet, modified based on the two load cases:

- Load Case A represents pressures on the windward parapet. The applicable positive wall pressures (from zone 4 or zone 5) are applied to the windward face. The applicable negative edge or corner roof pressure (from Zone 2 and Zone 3) are applied to the leeward face.
- Load case B represents pressures on the leeward parapet. The applicable positive wall pressure (from Zone 4 or Zone 5) is applied to the windward face. The applicable negative wall pressure (from Zone 4 or Zone 5) is applied to the leeward face.

The table indicates the pressures that apply based on the location of the parapet relative to the adjacent wall and roof zones.

Windward Parapet (Load Case A)	Windward Face	Zone 4	54.9
		Zone 5	54.9
	Leeward Face	Zone 2	-115.4
		Zone 3	-157.3
Leeward Parapet (Load Case B)	Windward Face	Zone 4	54.9
		Zone 5	54.9
	Leeward Face	Zone 4	-59.6
		Zone 5	-92.2
Kzt for parapet	<input type="text" value="1"/>		

In cases where pressure roof zones are not symmetric, parapet pressure changes between longitudinal and transverse wind directions. Click on the button [Click for Parapet Pressure] to see results table.

Parapet Pressures (psf):

Click for Parapet Pressure

Kzt for parapet

C&C Parapet Pressures for Mansard ...

MANSARD ROOF PARAPET PRESSURE

Longitudinal Wind (psf)

	Windward Face	Zone 4 (+)	55.3
		Zone 5 (+)	55.3
Windward Parapet (Load Case A)	Leeward Face	Zone 2n (-)	-149
		Zone 3e (-)	-149
		Zone 3r (-)	-177.3
		Zone 2" (-)	-116.3
		Zone 3" (-)	-158.5
Leeward Parapet (Load Case B)	Windward Face	Zone 4 (+)	55.3
		Zone 5 (+)	55.3
	Leeward Face	Zone 4 (-)	-60.1
		Zone 5 (-)	-74.1

Transverse Wind (psf)

	Windward Face	Zone 4 (+)	55.3
		Zone 5 (+)	55.3
Windward Parapet (Load Case A)	Leeward Face	Zone 2e (-)	-102.3
		Zone 3e (-)	-149
Leeward Parapet (Load Case B)	Windward Face	Zone 4 (+)	55.3
		Zone 5 (+)	55.3
	Leeward Face	Zone 4 (-)	-60.1
		Zone 5 (-)	-74.1

Close

Overhang Pressure

The design wind pressure on overhangs consist of applicable roof pressures on the top surface of the overhang and applicable wall pressure on the soffit of the overhang. The output table provides P_{ovh} for roof overhangs adjacent to Zone 2 and Zone 3. P_{ovh} is equal to the roof zone pressure for Zone 2 and is equal to 1.15 times the roof pressures for Zone 3.

Roof Overhang Pressures (psf):

Load Case	P _{ovh}		P _s	
	Zone 2	Zone 3	Zone 4	Zone 5
1	-115.4	-180.9	-59.6	-92.2
2	22.3	25.6	54.9	54.9

In cases where pressure roof zones are not symmetric, overhang pressure changes based on the adjacent pressure zone. Click on the button [Click for Overhang Pressure] to see results table.

Roof Overhang Pressures (psf):

Click for Overhang Pressure

C&C Overhang Pressures for Gable R...

GABLE ROOF OVERHANG PRESSURE

Overhang Along Building Width B (psf)

Load Case 1	Soffit Pressure, Ps	Zone 4 (-)	-60.3
		Zone 5 (-)	-74.3
	Roof Pressure, Povh	Zone 2n (-)	-149.6
		Zone 3e (-)	-172.04
		Zone 3r (-)	-204.585
Load Case 2	Soffit Pressure, Ps	Zone 4 (+)	55.5
		Zone 5 (+)	55.5
	Roof Pressure, Povh	Zone 2n (+)	33.6
		Zone 3e (+)	38.64
		Zone 3r (+)	38.64

Overhang Along Building Length L (psf)

Load Case 1	Soffit Pressure, Ps	Zone 4 (-)	-60.3
		Zone 5 (-)	-74.3
	Roof Pressure, Povh	Zone 2e (-)	-102.6
		Zone 3e (-)	-172.04
		Zone 3e (+)	-172.04
Load Case 2	Soffit Pressure, Ps	Zone 4 (+)	55.5
		Zone 5 (+)	55.5
	Roof Pressure, Povh	Zone 2e (+)	33.6
		Zone 3e (+)	38.64
		Zone 3e (+)	38.64

Close