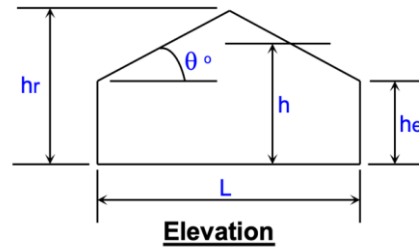
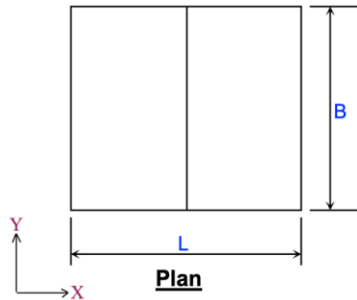




WIND LOADING ANALYSIS - WALL COMPONENTS & CLADDING (C&C)

Based on ASCE 7-16 Chapter 30 - Part 1 & Part 3

Client:		Designed By:	Ali Akbar Shaikhzadeh	Date:	20-Jan-20
Job Name:		Verified By:		Revision:	35%



DESIGN INPUT DATA

BASIC WIND SPEED, V

BUILDING WIDTH, L (HORIZONTAL DIMENSION PARALLEL TO X DIRECTION)

BUILDING LENGTH, B (HORIZONTAL DIMENSION PARALLEL TO Y DIRECTION)

ROOF TYPE

ROOF EAVE HEIGHT, h_e

ROOF RIDGE HEIGHT, h_r NOT APPLICABLE TO FLAT ROOFS

BUILDING RISK CATEGORY

EXPOSURE CATEGORY

ENCLOSURE CLASSIFICATION

ENCLOSED BUILDING

WIND DIRECTIONALITY FACTOR, K_d

TOPOGRAPHIC FACTOR, K_{zt}

GROUND ELEVATION FACTOR, K_e

EFFECTIVE AREA (AREA TRIBUTARY TO C&C), A_e

REFERENCE HEIGHT INCREMENT OF WINDWARD WALL

35	m/sec
18.00	m (SEE NOTE 3)
8.00	m (SEE NOTE 3)
Flat	
32.00	m
32.00	m
II	
C	
1	
0.85	
1.0	
1.0	
5.10	m ²
4.00	m

TABLE 1.5-1

SECTION 26.7

TABLE 26.13-1

TABLE 26.6-1

FIGURE 26.8-1

TABLE 26.9-1

SEE NOTE 10

RESULTING PARAMETERS & CONSTANT

θ	N/A	deg.
$h = (h_r + h_e) / 2$	32.00	m
GC_{pi}	± 0.18	
α	9.5	
Z_g	274.32	m

Roof angle

Mean roof height

Internal pressure coefficient

Terrain exposure constants

Terrain exposure constants

SEE NOTES 6 & 9

TABLE 26.13-1

TABLE 26.11-1

TABLE 26.11-1

WALL EXTERNAL PRESSURE COEFFICIENTS

PART 3, TABLE 30.5-1

Part 1, Table 30.3-1

====> N/A

a = width of corner zone 5

(GC_p) Zone 4 Positive

(GC_p) Zone 4 Negative

(GC_p) Zone 5 Positive

(GC_p) Zone 5 Negative

N/A	m
N/A	
N/A	
N/A	
N/A	

Part 3, Table 30.5-1

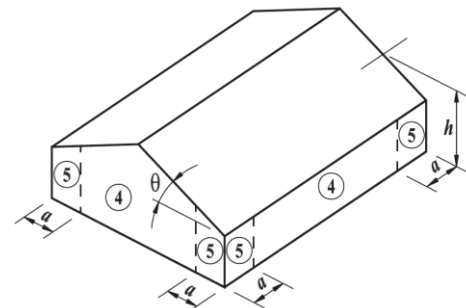
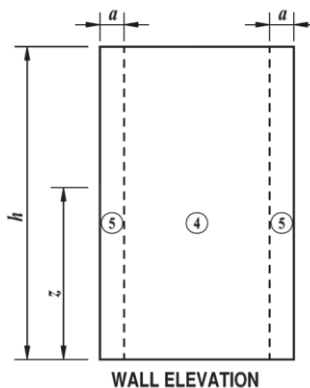
a = width of corner zone 5

(GC_p) Zone 4 Positive

(GC_p) Zone 4 Negative

(GC_p) Zone 5 Positive

0.90	m
0.88	
-0.89	
0.88	



PRESSURE ON WALL C&C

 P_{\min}

0.77 kPa

Minimum design wind pressure (see note 9)

Section 30.2.2

[illegible]

NOTES:

- 1- Plus and minus signs signify pressures acting toward and away from surfaces, respectively.
- 2- N/A = Not Applicable
- 3- The definition of ASCE 7-16 of L and B is as follows:

L = Horizontal dimension of building parallel to wind direction

B = Horizontal dimension of building normal to wind direction

This definition has been minorly changed in this spreadsheet for more clarification:

L = Horizontal dimension of building parallel to X direction

B = Horizontal dimension of building normal to Y direction

- 4- Each component shall be designed for maximum positive and negative pressures. Both positive and negative net pressures have been shown in the spreadsheet.
- 5- Values of (GC_p) for walls can be reduced by 10% when $\theta \leq 10^\circ$. (Notes in Figure 30.3-1)
- 6- Two cases shall be considered to determine the critical load requirements for the appropriate condition (Notes 3 on Table 26.13-1):
- a. A positive value of (GC_{pi}) applied to all internal surfaces, or
- b. A negative value of (GC_{pi}) applied to all internal surfaces.
- Both cases have been evaluated in this spreadsheet.
- 7- C&C elements with tributary areas greater than 65 m^2 shall be permitted to be designed using the provisions for MWFRS (Section 30.2.3)
- 8- (GC_p) is combined gust-effect factor and external pressure coefficients for C&C. The pressure coefficient values and gust-effect factor shall not be separated.
- 9- The design wind pressure for C&C of buildings shall not be less than a net pressure of 0.77 kPa acting in either direction normal to the surface (Section 30.2.2)

10- For C&C elements, the effective wind area is the span length multiplied by an effective width that need not be less than one-third the span length. For cladding !
the effective wind area shall not be greater than the area that is tributary to an individual fastener. (Section 26.2)