

## Trial Design Instructions

This problem is representative of a common engineering task that is performed in structural engineering offices on a routine basis. **The purpose of this exercise is to evaluate if practicing engineers are able to accurately understand and consistently implement the current code.**

Solutions are to be submitted together with calculations and a copy of the Personal Information Form. Please do not sign or mark the answer sheets with your name as all solutions are to be submitted anonymously.

The answers should be mailed, faxed, or scanned in PDF format and emailed and received by **March 1, 2012**. Please send answers together with your Personal Information Form to the SEI office in care of:

Suzanne Fisher  
Structural Engineering Institute  
1801 Alexander Bell Drive  
Reston, VA 20191-4400  
FAX: 703-295-6361  
sfisher@asce.org

**PERSONAL INFORMATION FORM**

**Education and Professional Registration:**

Undergraduate engineering degree: Year:

Undergraduate engineering degree: Year:

Graduate engineering degree: Year:

Graduate engineering degree: Year:

Non-engineering degree: Year:

List states in which registered as a **Professional Engineer**: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

List states in which registered as a **Structural Engineer**: \_\_\_\_\_

\_\_\_\_\_

Total engineering experience: \_\_\_\_\_ years

Do you participate in a continuing education program? \_\_\_\_\_

**Current or Most Recent Employer:**

Type of firm (select from list): \_\_\_\_\_

Location: \_\_\_\_\_  
(State in USA or Country if not USA)

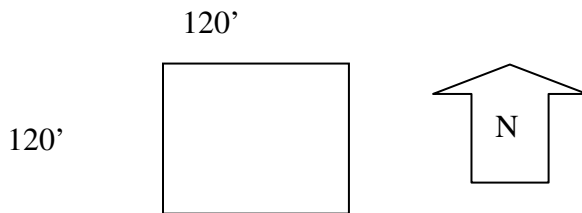
- A = Architect
- E = Engineer
- EC = Engineer-Contractor
- AE = Architect-Engineer
- EA = Engineer-Architect
- GEO = Soils or Geotechnical
- U = University or College

Trial Design Problem – Wind Analysis using ASCE 7-10 - 2011

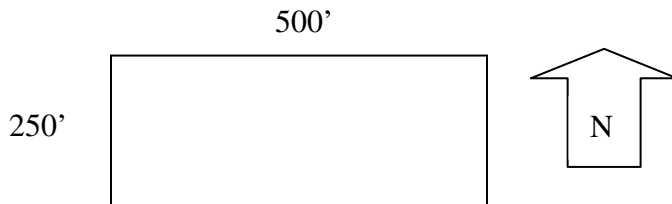
Determine the Maximum Design Wind Pressure (p) in psf for the Windward and Leeward sides for the Main Wind Force Resisting Systems (MWFRS) of the following buildings using ASCE 7-10. The maximum pressure should be determined at the top of the structure. Find Design Pressures for both the Longitudinal and Transverse Direction. All Analysis Methods may be use.

For all problems, assume that the Topographic Factor,  $K_{zt}=1.0$ .

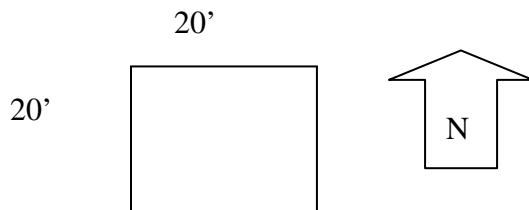
- 1) 200' Tall High-Rise in Denver, Colorado.
  - Middle of City; Exposure Category B
  - Concrete Moment Frame with Cast-in-Place Floors
  - Flat Roof



- 2) 50' Tall Hospital in Chicago, Illinois
  - On Lake Michigan; Exposure Category D
  - Steel Moment Frame with Concrete on Metal Deck Floors except Roof which is Metal Deck
  - Flat Roof



- 3) 15' Park Pavilion in San Francisco, California
  - Middle of Park; Exposure Category C
  - Wood Decked Roof over Wood Timbered Roof
  - Open on all Four Sides
  - Flat Roof
  - Cantilever Pole Construction
  - Fundamental Natural Frequency,  $n_1=5$  seconds,  $\beta=0.2$  or 2%



## **Answer Summary**

Time to Complete: \_\_\_\_\_

MWFRS Design Wind Pressure for Problem 1 (Denver): \_\_\_\_\_

MWFRS Design Wind Pressure for Problem 2 (Chicago): \_\_\_\_\_

MWFRS Design Wind Pressure for Problem 3 (San Francisco): \_\_\_\_\_

Method of Solution (Hand Calculation, Software Package, Simplified Charts, etc.): \_\_\_\_\_

Determine the Maximum Design Wind Pressure ( $p$ ) in psf for the Windward and Leeward sides for the Main Wind Force Resisting Systems (MWFRS) of the following buildings using ASCE 7-10. The maximum pressure should be determined at the top of the structure. Find Design Pressures for both the Longitudinal and Transverse Direction.

Please submit your entire solution.