

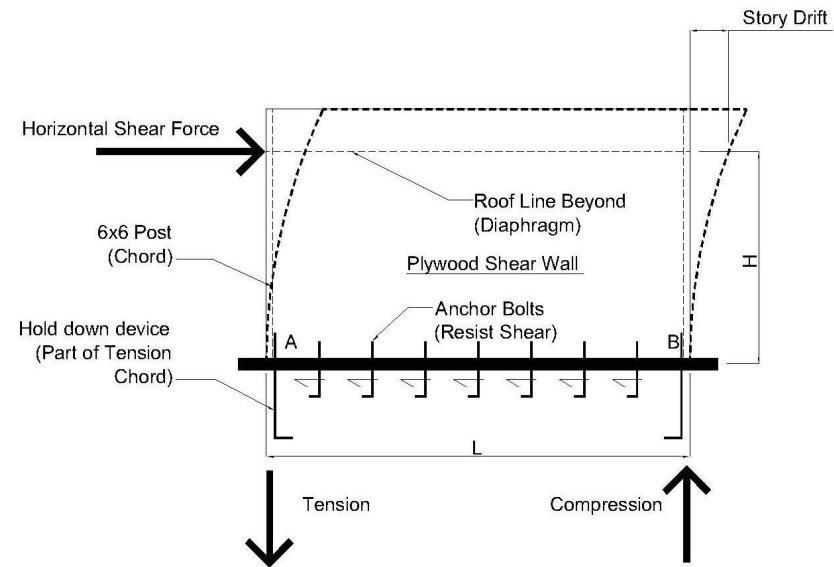
# LF Exam Terminology

## Chords

**Chords** – Elements that resist bending through axial tension and compression. The chords of the diaphragm and shear wall boundary elements are analogous to the flanges of a steel beam and the top and bottom chords of a truss.

The chords of a diaphragm are perpendicular to the applied load.

The chords of a shear wall are the boundary members



Overturning Moment (OTM) = Force x Distance

$OTM = (\text{Horizontal Shear Force})(H)$

Chord Force (Tension or Compression) = Moment / Distance

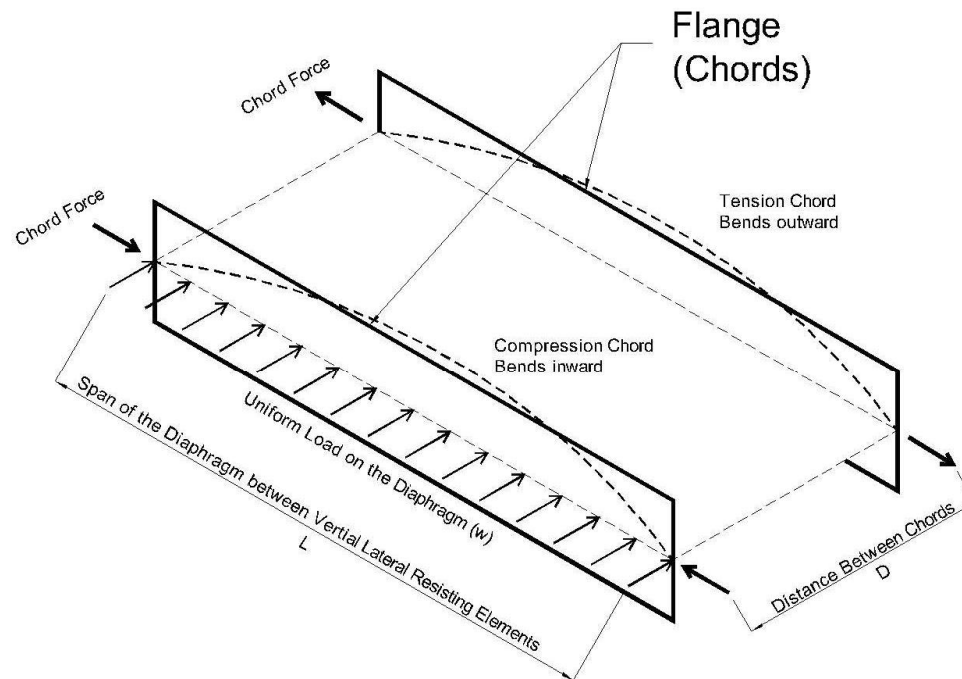
Chord Force =  $OTM / L$

'H' - Height of the shear wall between levels / diaphragms (do not include the parapet)

'L' - Length of the shear wall - the distance between the chords / holddown devices

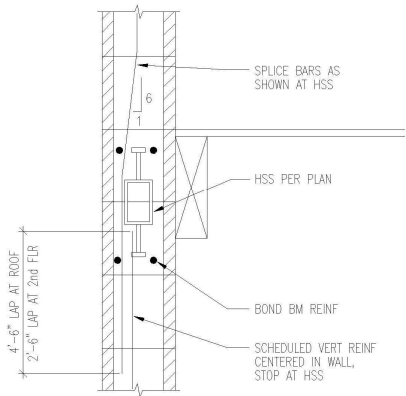
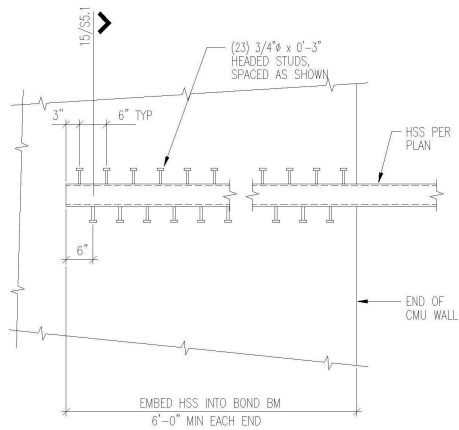
# LF Exam Terminology

## Chords



Chords - Analogous to the flanges of a steel beam

# LF Exam Terminology Chords Continued



# Concepts & Problem Solving

## Chord Forces

Example: Calculate the chord forces in walls C & D (from the previous example)

- 1) The chords of the building are normal or perpendicular to the applied load.
- 2) Visualize the building as a beam spanning between Wall A and Wall B
- 3) Get the applied load in a force per unit length. It is 287.4 #/ft (as previously calculated as the reaction at the roof diaphragm level). Or the load is the East / West Diaphragm shear force of 22,992# / 80'

- 4) Find the moment on the building using  $wL^2 / 8$

$$M = (287.4 \text{ \#/ft})(80')^2 / 8 = \underline{229,920 \text{ \#-ft}}$$

- 5) To calculate the chord force, divide the moment by the distance between the chords.  
or  $F = M/d$

$$F = 229,920 \text{ \#-ft} / 60' = \underline{3,832\#}$$

