Mechanics-Based and Prescriptive Codes

Engineered vs Prescriptive Construction

Mechanics-Based

- Traditional Code for Structures Designed using Engineering Mechanics-Based Design
- Typically Use Loads Determined for Site and Then Determine Load Path and Size Members According to Physics

Codes Used: IBC and NFPA 5000

- Traditionally, this type of design was covered in UBC, BOCA, and National Building Code.
Prescriptive Codes

- Typically restricted to residential construction (one- and two- family dwelling)
- Includes detached houses and townhouses (Must have separate means of egress for each house.)

Prescriptive Codes

- Design consists of laying out floor plan following a set of prescriptive restrictions placed on the design depending on the site, type of sheathing used, number of stories in structure, and finish materials used.

Prescriptive Codes

- Traditionally controlled by the Council of Council of American Building Officials (CABO) One- and Two-Family Dwelling Code
- Now controlled by the International Residential Code (IRC)
Mechanics vs Prescriptive

- Shear Walls in IBC/NFPA 5000
  - Segmented (Traditional Shear Wall Design)
  - Perforated with Force Transfer (New method to account for effects of openings)
  - Prescriptive ("Conventional Construction")

- Shear Walls in IRC
  - Prescriptive ("Conventional Construction")
  - Fully-Sheathed Walls (Perforated Shear Walls Without Force Transfer)

Shear Wall Design

- IBC/NFPA 5000 – Use APA Tables, Mechanics Based Analysis
- IRC – Percentage of Sheathing Requirements Depending on Floor and Wind/Seismic Loading
Floor Design

- IBC/NFPA 5000 – Use NDS/LRFD and loading
- IRC – Span Tables assuming either 30 or 40 psf live loading and 10 psf dead load.