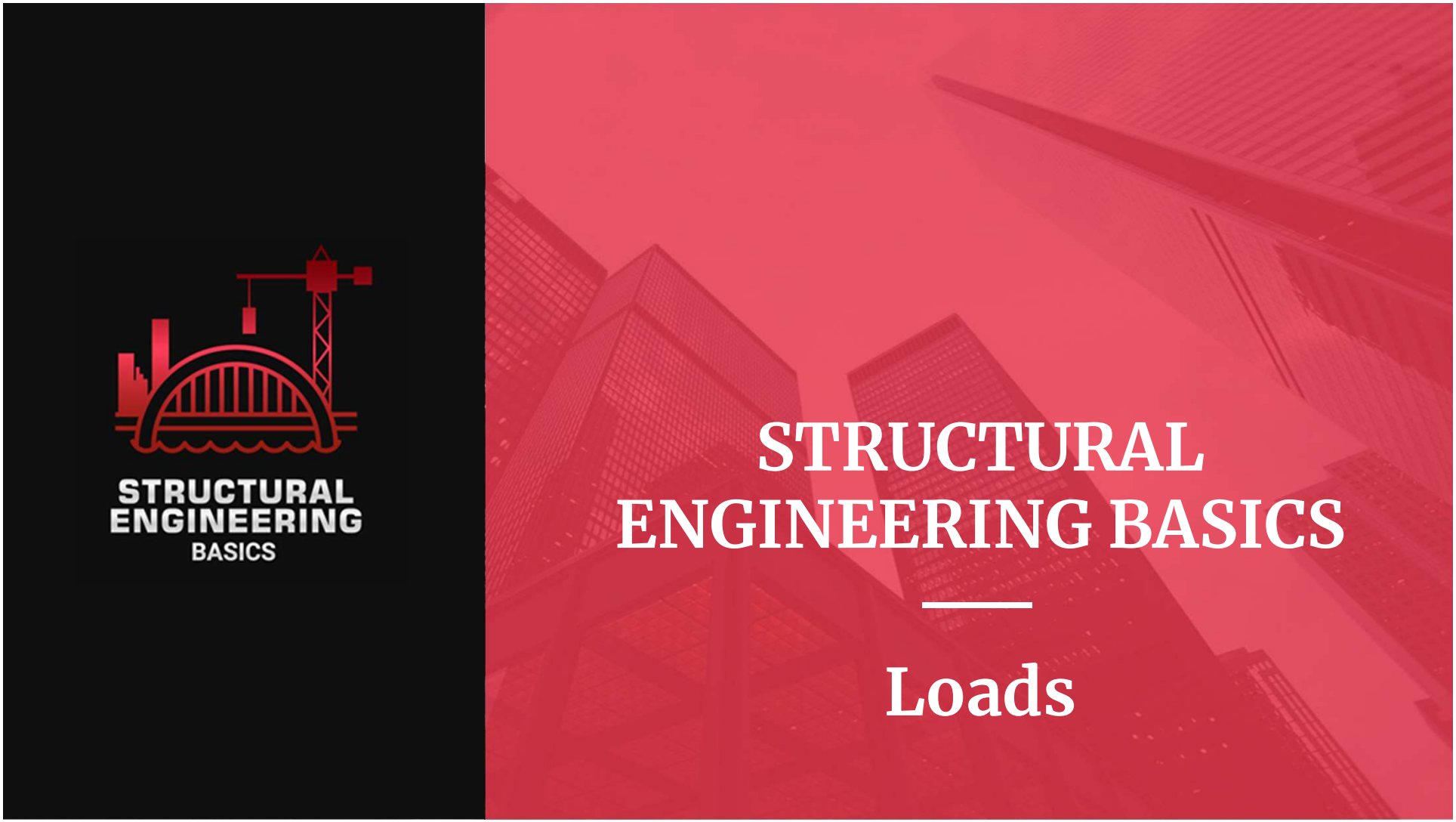


STRUCTURAL ENGINEERING BASICS

Loads

STRUCTURAL ENGINEERING BASICS

Vertical Loads

Dead Loads:

- Weight of the structure
- Permanent Construction Material
- Permanent Equipment
- Partitions

STRUCTURAL ENGINEERING BASICS

Vertical Loads

Live Loads:

- Weight of people
- Weight of Furniture
- Equipment that is flexible

STRUCTURAL ENGINEERING BASICS

STRUCTURAL ENGINEERING BASICS

Vertical Loads

Snow Loads:

STRUCTURAL ENGINEERING BASICS

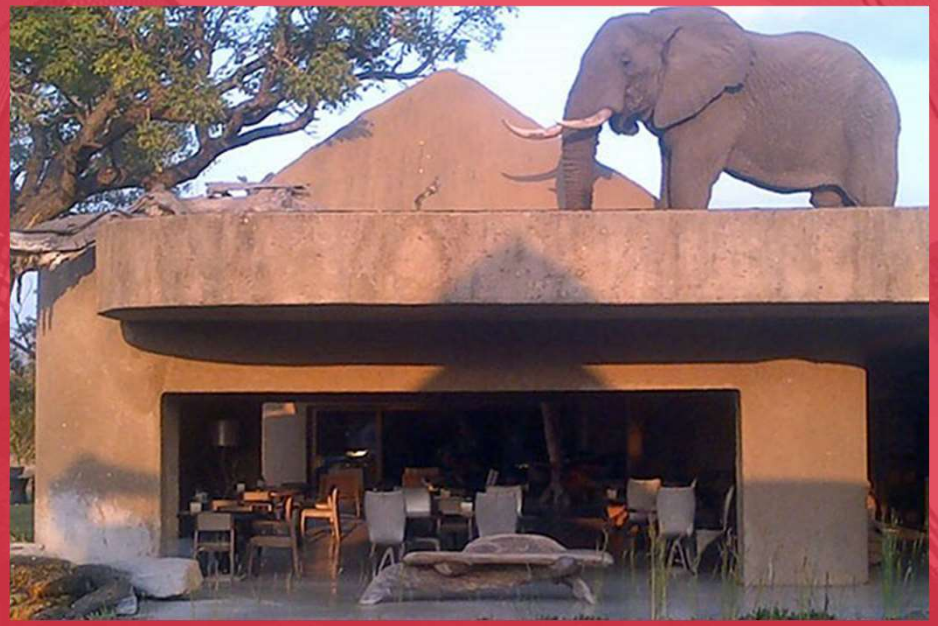
Vertical Loads

Snow Loads:

STRUCTURAL ENGINEERING BASICS

Vertical Loads

Snow Loads:



STRUCTURAL ENGINEERING BASICS

Vertical Loads

Snow Loads:

- 1 foot of snow on a 2000 square foot house is around 40 000 pounds of snow, or 10 elephants!

STRUCTURAL ENGINEERING
BASICS

Horizontal Loads

Wind Loads:

- Positive & Negative Pressures
- Dependant on terrain, building size/height, opening
- Different loads for different parts of the building

STRUCTURAL ENGINEERING BASICS

Horizontal Loads

Wind Loads:

STRUCTURAL ENGINEERING BASICS

Horizontal Loads

Earthquake Loads:

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Horizontal Loads

Earth Pressure/Surcharge Loads:

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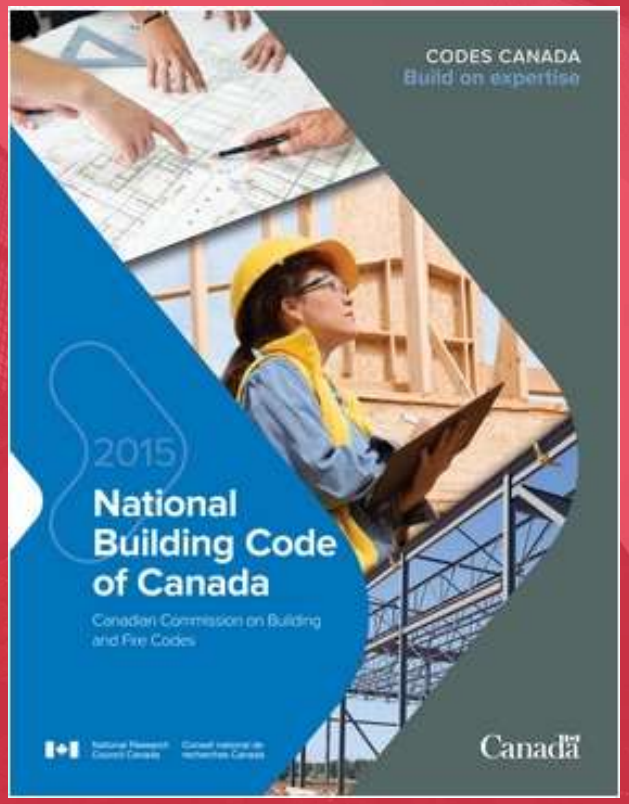
Building Codes



STRUCTURAL ENGINEERING BASICS

Building Codes

Limit States Design
- Ultimate Limit State
→ Strength
- Serviceability Limit State
→ Deflection, Vibration

- Factors of Safety
→ Overdesign?

STRUCTURAL ENGINEERING
BASICS

Building Codes

- Load Combinations:

→ Principle Loads and Companion Loads
→ Probability Based

- Importance Factors

STRUCTURAL ENGINEERING BASICS

Building Codes

- Different live loads dependant on type of occupancy and building use
- Live load reduction factors

STRUCTURAL ENGINEERING
BASICS

Building Codes

- Different Wind, Snow, Rain and Earthquake loads dependant on location
- Based on 1 in 50 year storm

STRUCTURAL ENGINEERING BASICS

Building Codes

Snow buildup:
- High Roof to Low Roof
→ Based on height difference and size of high roof
- Buildup around mechanical units, signs, projections
- Roof failures are most common in build up zones