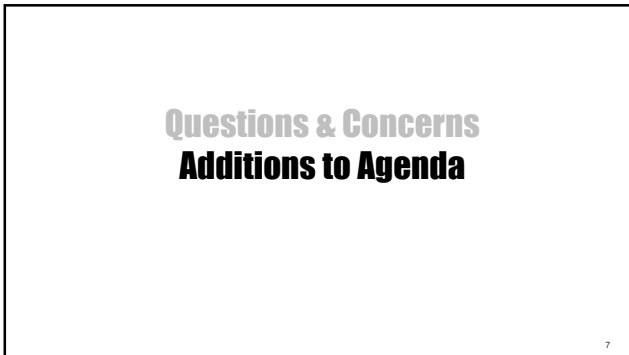
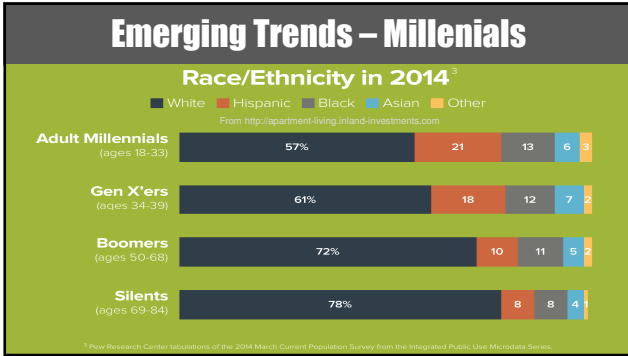


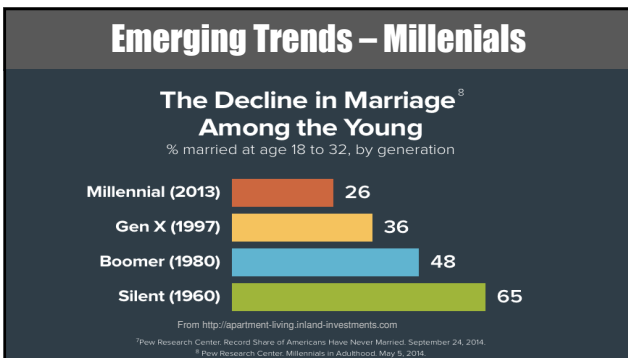


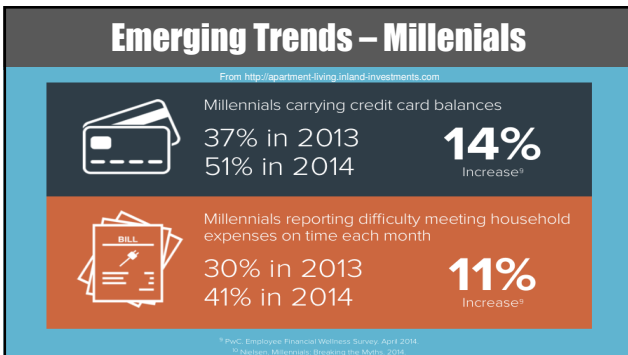


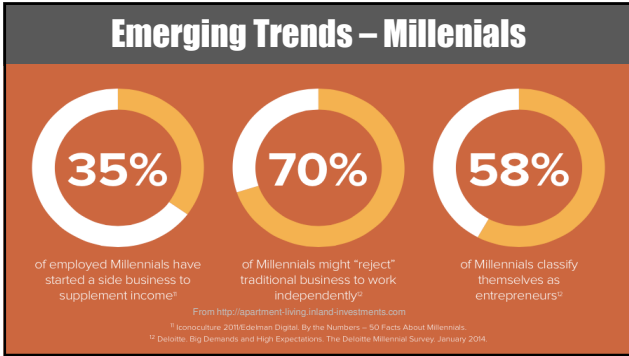
Agenda	
8:00 am – 8:30 am	Introductions <ul style="list-style-type: none"> • Emerging Trends • Concrete Innovations
8:30 am – 9:00 am	Concrete Solutions <ul style="list-style-type: none"> • Strength and Durability • Safety • Ease of Use • Value • Sustainability
9:15 am – 9:30 am	Break
9:30 am – 10:30 am	ICF in midrise Buildings
10:30 am – 10:45 am	Break
10:45 am – 11:00 am	Building Design Assistance Program
11:00 am – 12:00	Panel Discussion

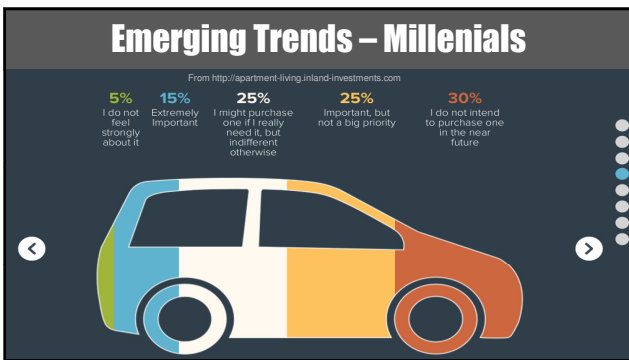


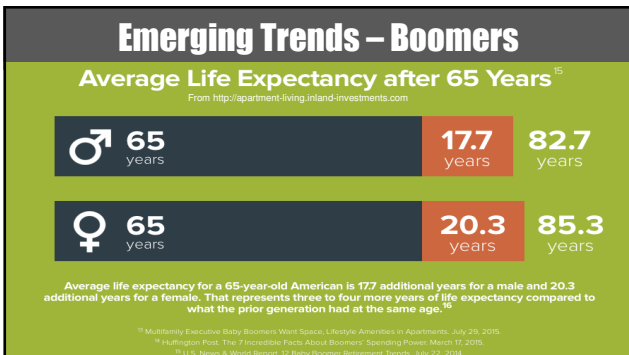


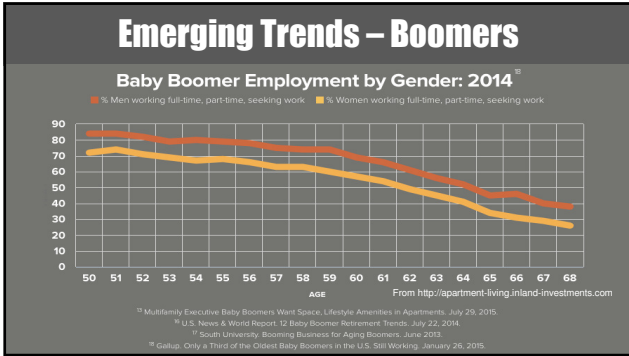


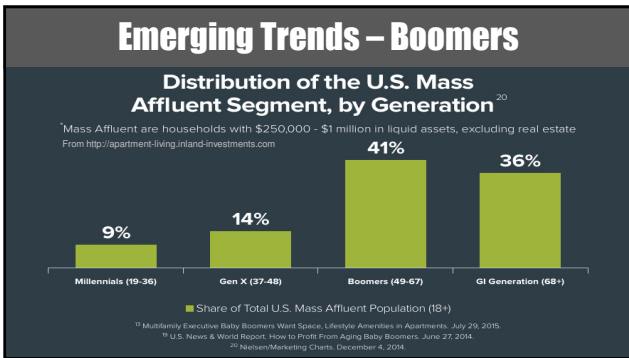


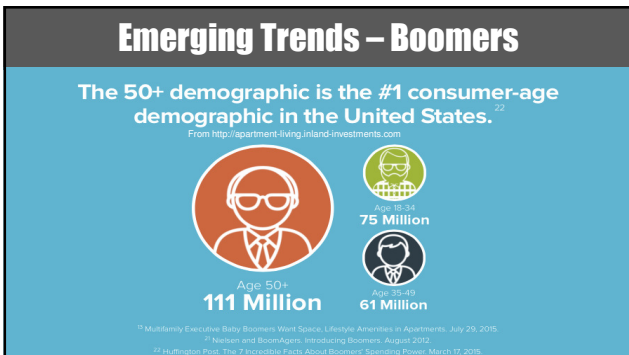


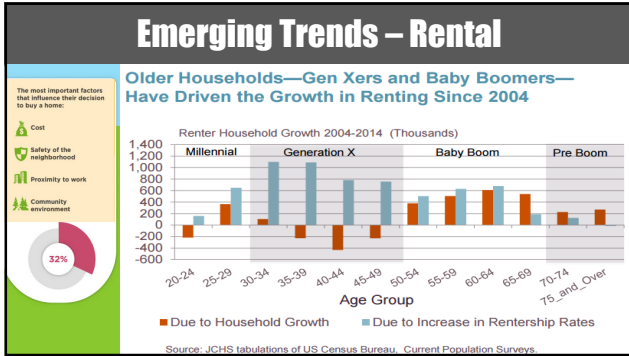


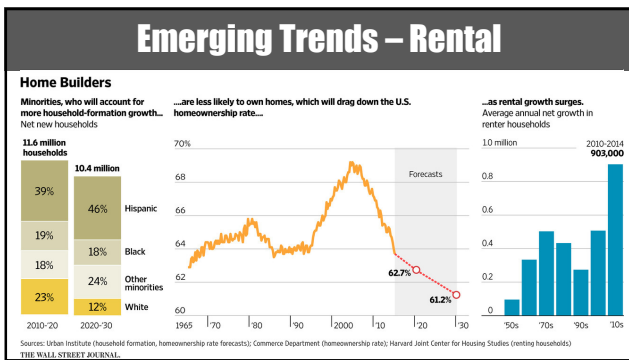














Emerging Trends – Construction



Emerging Trends – Rise of Type V



Emerging Trends – Rise of Type V

- Sprinkler Trade-offs
 - Increased No. Stories
 - Increased Areas
 - Increase Heights
 - Reduced FD Access
 - Firewalls made of combustible material

BUILDING ELEMENT	TYPE I		TYPE II		TYPE III		TYPE IV		TYPE V	
	A	B	A	B	A	B	HT	A	B	
Primary structural frame ^a (see Section 202)	3 ^b	2 ^b	1	0	1	0	HT	1	0	
Roofing walls										
Exterior ^c	3	2	1	0	2	2	2	2	1	
Interior	3 ^d	2 ^d	1	0	1	0	1/HT	1	0	
Nonbearing walls and partitions										
Exterior										
Interior ^e	0	0	0	0	0	0	See Section 602.4.6	0	0	
Floor construction and associated secondary members (see Section 202)	2	2	1	0	1	0	HT	1	0	
Roof construction and associated secondary members (see Section 202)	1	1/2	1/1	1/1	0/1	1/1	0	HT	1/1	

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Results: Health Compromised



ARE WE DOING BETTER?



Cross Laminated Timber (CLT)



Nottingham Fire – A chem Lab!



Results: Safety Compromised



Results: Safety Compromised

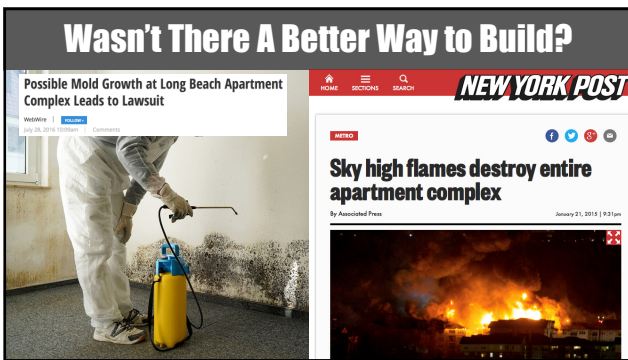




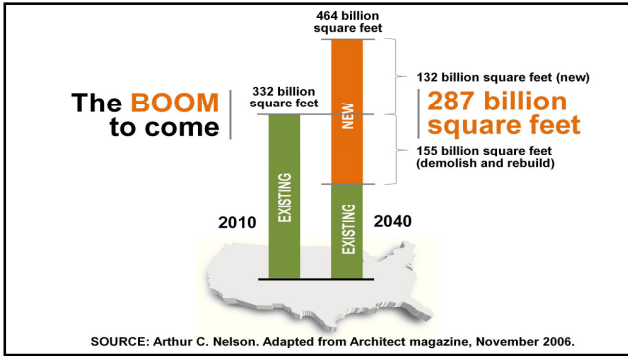


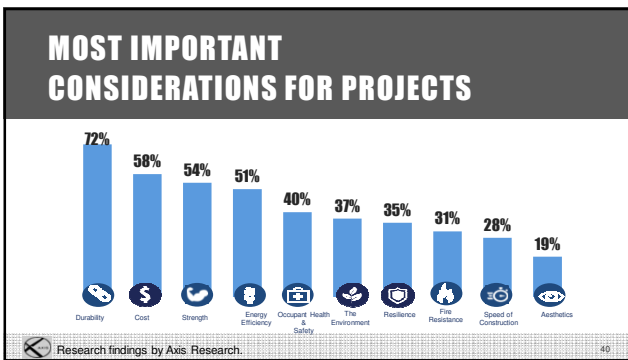


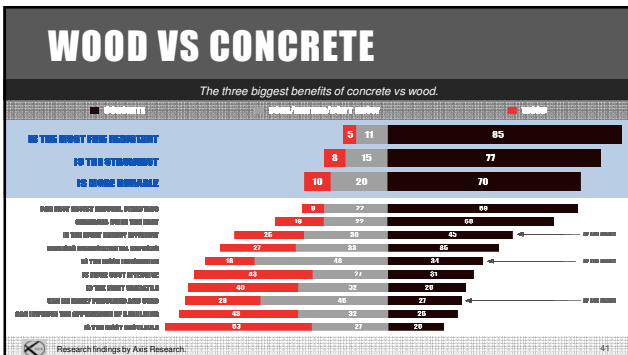












5 Key Elements to Beautiful, Innovative Design

Choice and flexibility
Buildings can be molded into any shape, size, color and finish you can think of. Concrete conforms to your design—no other way around.

Easy to use
Unlike other materials, concrete is made specifically for each project to meet the demanding needs of the owner, design team and contractor.

Awe-inspiring
Experience a virtually limitless building material. Concrete can be transformed into some of the most innovative, beautiful designs you'll encounter.

Saves the day and your budget
Concrete can be adapted for many different uses with little effort, so you can quickly change designs—without needing new materials.

Comfort—naturally
Concrete inherently dampens sound, which contributes to a quiet, peaceful living environment—particularly important for residential buildings.

What Material Offers So Many Advantages?

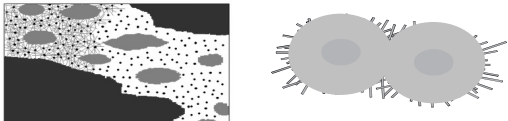


Concrete Structures

- Key advantage
 - Strength & Durability
 - Beauty
 - Value
 - Safety
 - Sustainable

Strength & Durability

- Cement reacts with water to form cementitious compounds
- Can set and harden under water



Cement + Water → **C-S-H + CH**
Calcium Silicate Hydrate + Calcium Hydroxide ⁴⁴

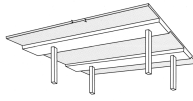
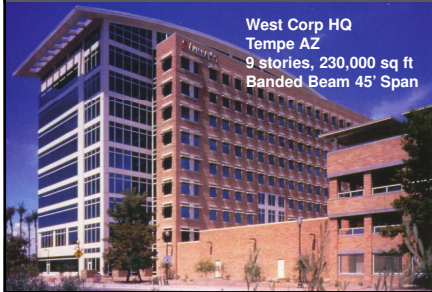
What is High-Performance

- Fire Resistance
- High-Strength
- High-Early Strength
- High-Durability
- Self-Consolidating
- Long Life in Severe Environments
- Low Permeability and Diffusion
- Inhibition of Bacterial and Mold Growth
- Environmental Benefits



Greater Spans

West Corp HQ
Tempe AZ
9 stories, 230,000 sq ft
Banded Beam 45' Span



Floor to Floor Height

Museum Towers
Cambridge MA
234 ft, 24 stories
(Steel 22 Stories)



Speed = Early Occupancy

A NEED FOR SPEED

COORDINATING FAST PACED URBAN CONSTRUCTION


*By Ramon Gilman, P.E., S.E., FSEI,
Phil Murray, P.E.,
Gary Safford, P.E.,
and Perry Vincenza*



Figure 1. Austin West Cluster, View from High Line Deck

Speed = Early Occupancy

Federal Regulatory Commission, DC
11 stories, 900,000 ft²
Completed in 22 months



Time To Completion Comparison

Category	Concrete (Weeks)	Steel (Weeks)
Total	64.1	72.8
High	69.3	67.2
Mid	62.0	73.1
Low	57.0	66.0

Mean Number of Weeks

49

Concrete Innovation



ICF **SCC** **Tilt Up**







Breeze House, Tokyo



Tilt-Up - St. Ignatius Chapel, Seattle



Tilt-Up - Innovation Village, FL







