Oregon's Aggregate & Concrete Industry

December 9, 2014

Oregon Concrete & Aggregate PRODUCERS ASSOCIATION

Overview

- Size & Scope of Industry
- Economic Data & Trends
- Sustainability
- Choosing Construction Material
- Innovation
- Challenges & Summary

Presenters

Rich Angstrom
OCAPA President

KC Klosterman
Oldcastle Materials – Director of Community Relations

Tien Peng, LEED AP, CGP, PMP
National Ready Mix Concrete Association – Vice President of Sustainability

Brad Moyes, PE, SE, LEED AP
KPFF Consulting Engineers – Principal

Dave Frentress
CalPortland – Marketing Director NW Division

Size & Scope of Industry

Rich Angstrom
OCAPA President

Curbs & Sidewalks

Metro Parking Rehabilitation

Concrete Intersections

Irving-Prairie Rd. Intersection

Concrete Intersections

Bend Roundabouts

Streets and Special Transit Projects

Lane Transit District

Lane Transit District Bus Rapid Transit
Pioneer Parkway

Streets and Special Transit Projects

Lane Transit District

SW Moody Avenue, Portland

Bridges

15-Mile Creek Bridge

Airport Headquarters & Parking Garage

Port of Portland

Airport Headquarters & Parking Garage

Port of Portland

Port of Portland

Water Storage & Treatment

Oak Lodge Water Reclamation

City of Coquille Wastewater Facility

Water Storage & Treatment

Market of Choice

Distribution Center

Market of Choice

Distribution Center

Eugene, OR

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Dams & Fish Passages

Dorena Hydro Electric Dam

Dams & Fish Passages

Dorena Hydro Electric Dam

Soda Springs Dam Fish Passage

Dams & Fish Passages

Soda Springs Dam Fish Passage

Single-Family Homes

ICF House

Single-Family Homes

Single Family Residence

High-Rise Residential

Mirabella – Portland

High-Rise Residential

Mirabella – Portland

High-Rise Residential

University Pointe

Portland, OR

High-Rise Residential

University Pointe

Portland, OR

Schools

Vernonia School

Vernonia School

Secure Facilities

Armed Forces Reserve Center

Secure Facilities

Armed Forces Reserve Center

Much More Than Sidewalks & Curbs

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Economic Data & Trends

KC Klosterman
Oldcastle Materials
Director of Community Relations

Ready Mix Concrete & Construction Aggregates:

Current Economic Conditions

- **Key Facts**
- **Public agencies purchase more than half of all construction aggregates (Currently nearly 65%)**
  - Highways, streets, bridges, rail lines & utilities
  - Water & waste water facilities
  - Public offices, shops & schools
- **Public agencies purchase about 35% of all ready mix concrete.**
  - Concrete highways/roads, bridges, sidewalks, etc.
  - Water & waste water facilities
  - Public offices, shops & schools

Per Capita Consumption

- The average consumption of construction aggregates is 8-12 tons per capita/per year.
- The average consumption of ready mix concrete is 0.75 to 1.2 cubic yards per capita/per year
- Oregon Population is 3.96 million

Construction Aggregates Employment

Total Current Production Employees
~1,000 -1,200

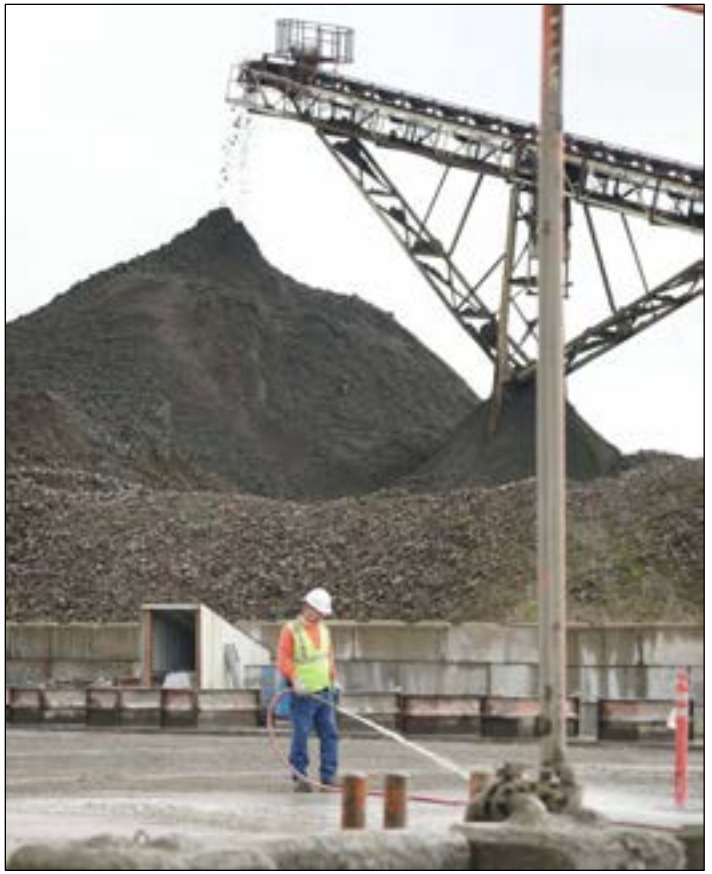
Production Employees During Peak:
~2,000

Grading, Placement, 3rd Party Delivery and Engineering ~ 1,500

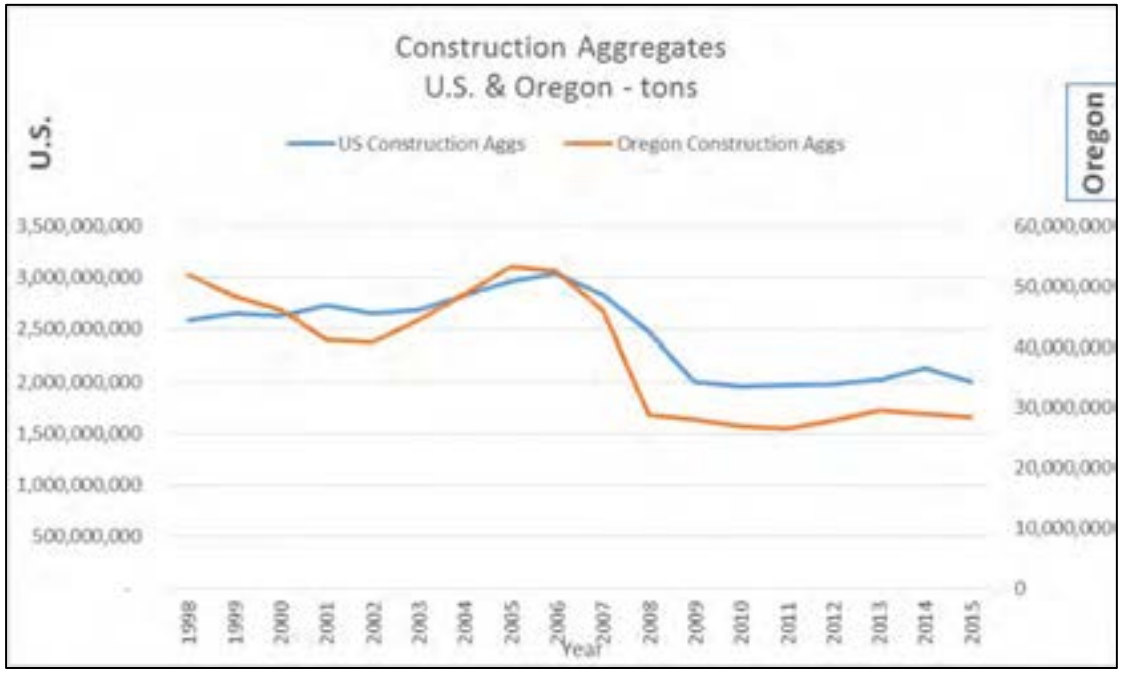
Suppliers/Vendors/Service Related
~ 1,000

Total Affected Direct Employment:

- Current ~ 3,500
- During peak ~ 5,000



Construction aggregates – tons



Year	U.S. Construction Aggs	Oregon Construction Aggs
1998	2,590,000,000	51,894,654
1999	2,650,000,000	48,326,956
2000	2,630,000,000	46,137,690
2001	2,730,000,000	41,098,461
2002	2,650,000,000	40,810,712
2003	2,690,000,000	44,351,427
2004	2,830,000,000	48,802,085
2005	2,960,000,000	53,181,594
2006	3,040,000,000	52,474,051
2007	2,830,000,000	45,916,951
2008	2,480,000,000	28,898,705
2009	2,006,000,000	28,057,862
2010	1,955,000,000	26,905,138
2011	1,970,000,000	26,519,043
2012	1,982,000,000	27,966,897
2013	2,020,000,000	29,555,747
2014	2,130,000,000	29,000,000
2015	2,000,000,000	28,500,000

Year end 2014 & full year 2015, est.

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Construction Aggregates Oregon Forecast

- **2014 – 29 million tons**
- **2015 – 28 million tons**

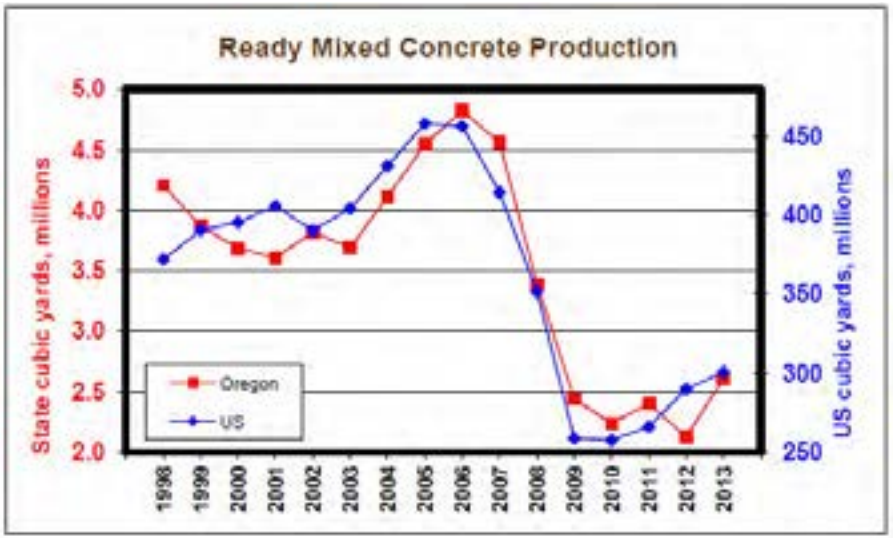
Estimate by KC Klosterman, Oldcastle Materials

- **By sector:**
  - Public agency – declining to significantly declining
  - Residential – positive growth
  - Commercial – positive growth
  - Industrial – flat growth

Ready Mix Concrete Employment

- Total Current production employees ~1,000-1,200
  - Production employees during peak ~1,600
- Installation, engineering, finishing contractor related employment ~ 1,000
- Suppliers/vendors/service related ~ 800
- Total affected direct employment:
  - Current ~ 2,800
  - During peak ~ 4,000

Ready Mix Concrete Historical Volumes – Oregon



Estimated Ready Mixed Concrete Production

	Oregon	US	Percent of US
1998	4,207,000	372,033,000	1.1%
1999	3,869,000	390,658,000	1.0%
2000	3,685,000	395,614,000	0.9%
2001	3,606,000	406,091,000	0.9%
2002	3,822,000	390,301,000	1.0%
2003	3,691,000	404,333,000	0.9%
2004	4,111,000	431,498,000	1.0%
2005	4,544,000	458,290,000	1.0%
2006	4,827,000	456,768,000	1.1%
2007	4,557,000	414,644,000	1.1%
2008	3,391,000	351,673,000	1.0%
2009	2,438,000	258,551,000	0.9%
2010	2,237,000	257,423,000	0.9%
2011	2,402,000	266,039,000	0.9%
2012	2,125,000	289,781,000	0.7%
2013	2,607,000	300,800,000	0.9%

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Ready Mix Concrete Oregon Forecast

- **2014 – 2.9 million cubic yards**
- **2015 – 3.3 million cubic yards**

This is the Portland Cement Association forecast assuming continuous economic recovery.

By sector:

- Public agency – flat to slightly declining
- Residential – positive growth
- Commercial – positive growth

Conclusion
Concrete & Aggregates

- Demand for construction aggregates, concrete, as well as asphalt paving materials is highly affected by public agency demands.

- Road and bridge maintenance and improvements are the single largest consumers of these materials.

- Should a long term fix to the currently underfunded transportation maintenance and project funds continue to be delayed at State and Federal levels, we can expect to see the demand for the products referenced herein to drop by as much as **20%** in 2016, and as much as **35%** in 2017.

Data Sources

- US Bureau of Mines
- Oregon Dept. of Geology
- Portland Cement Assoc.
- Ash Grove Cement
- Oldcastle Materials Group
- US Census

Sustainability

Tien Peng
LEED AP, CGP, PMP
National Ready Mix
Concrete Association (NRMCA)
Vice President of Sustainability

Cement and Concrete

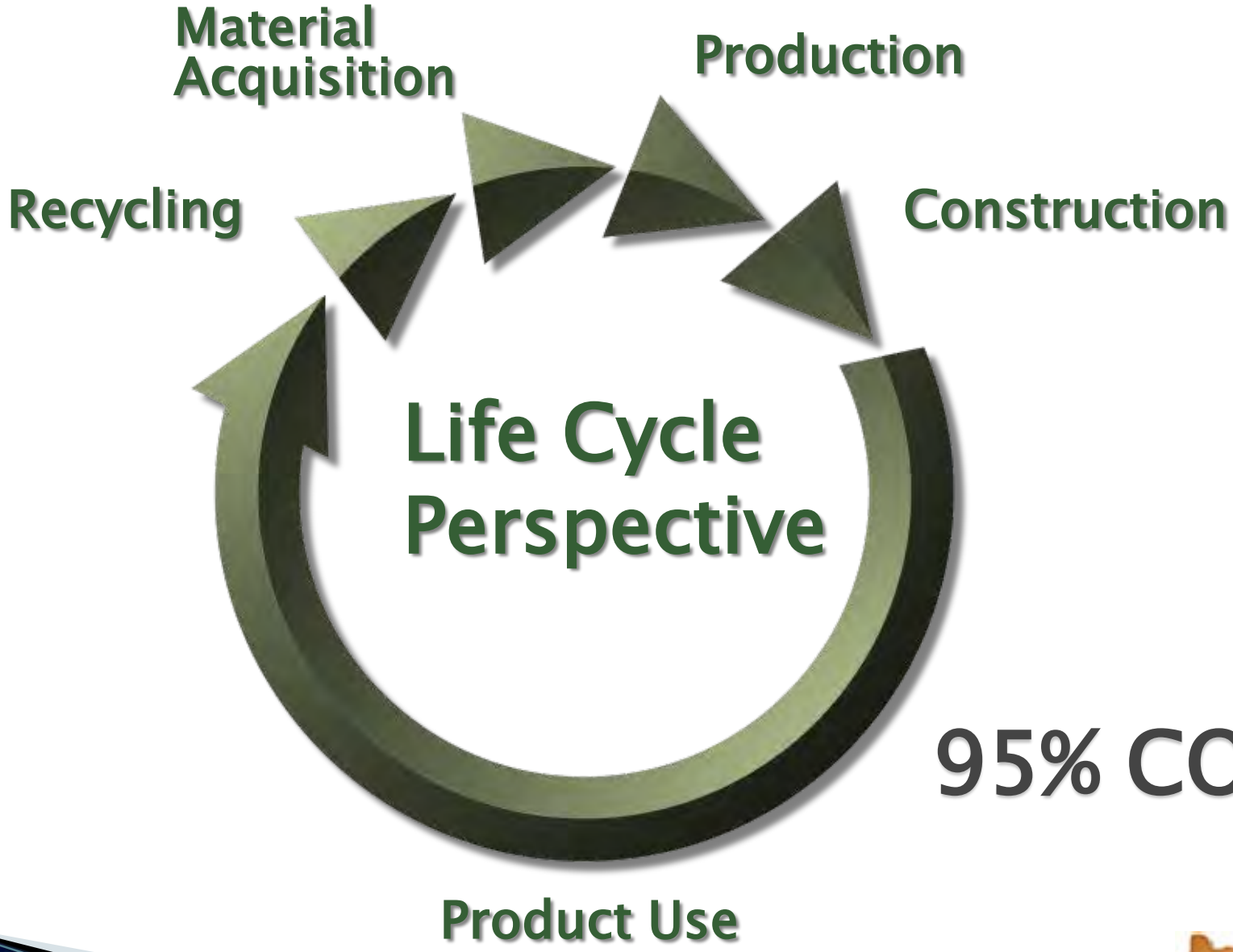
- **Cement** – ingredient of concrete: Fine, gray powder mixed with water, sand gravel to form concrete
- **Cement** acts as the binding agent
- **Cement** is produced by cement manufacturers
- **Concrete** produced by concrete producers

Cement and CO_2

- **Amounts of CO_2 embodied in concrete primarily function of cement content**
- **On average, 927 kg of CO_2 emitted for every 1000 kg of portland cement produced**
- **U.S. cement industry 1.5% of U.S. CO_2 emissions**

Energy consumption in the U.S.

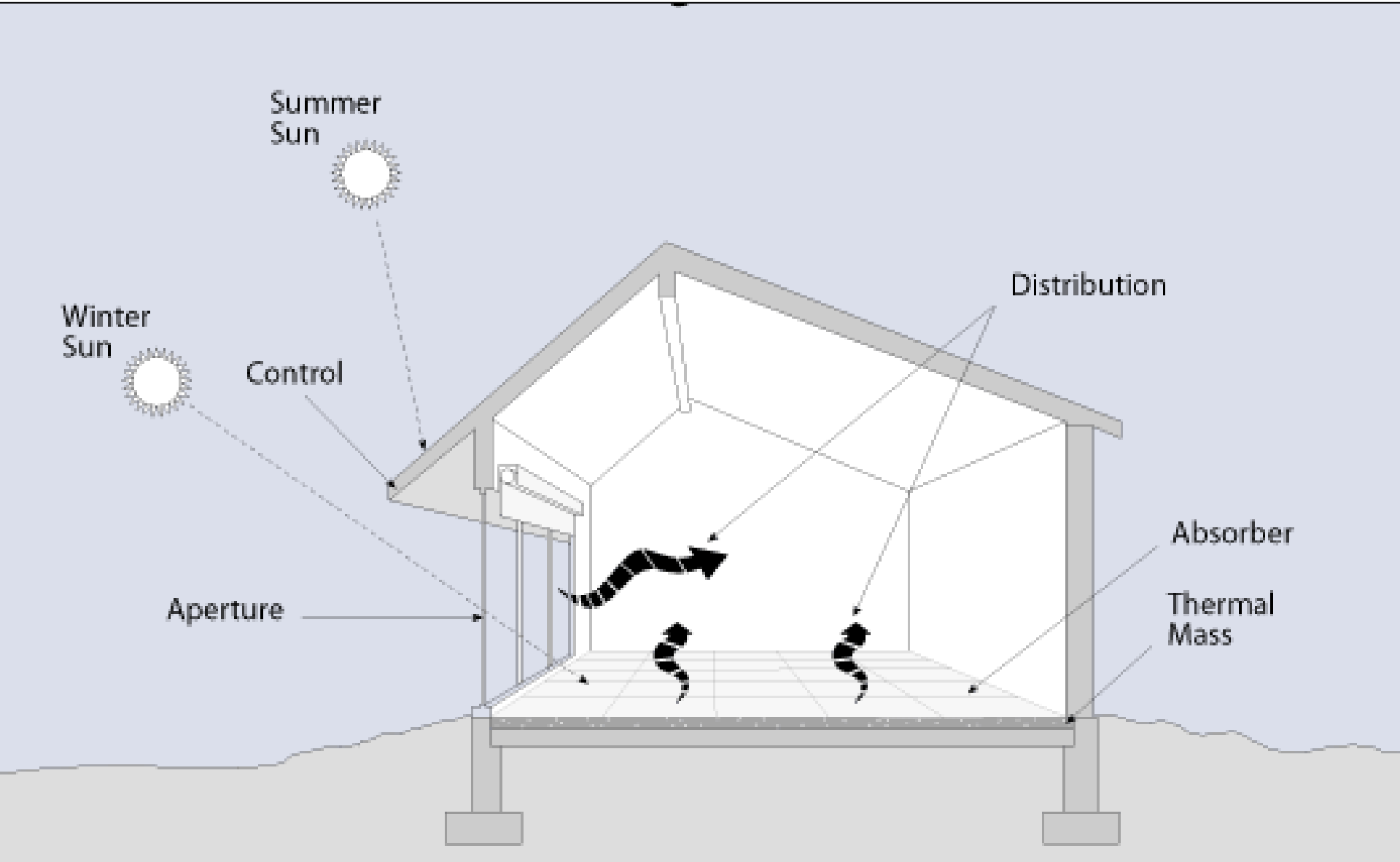
- Petroleum refining (6.5%)
- Steel production at (1.8%)
- Wood production at (0.5%)
- Cement manufacturing (0.33%)


Material Acquisition
Production
Recycling
Construction
Life Cycle Perspective
Product Use

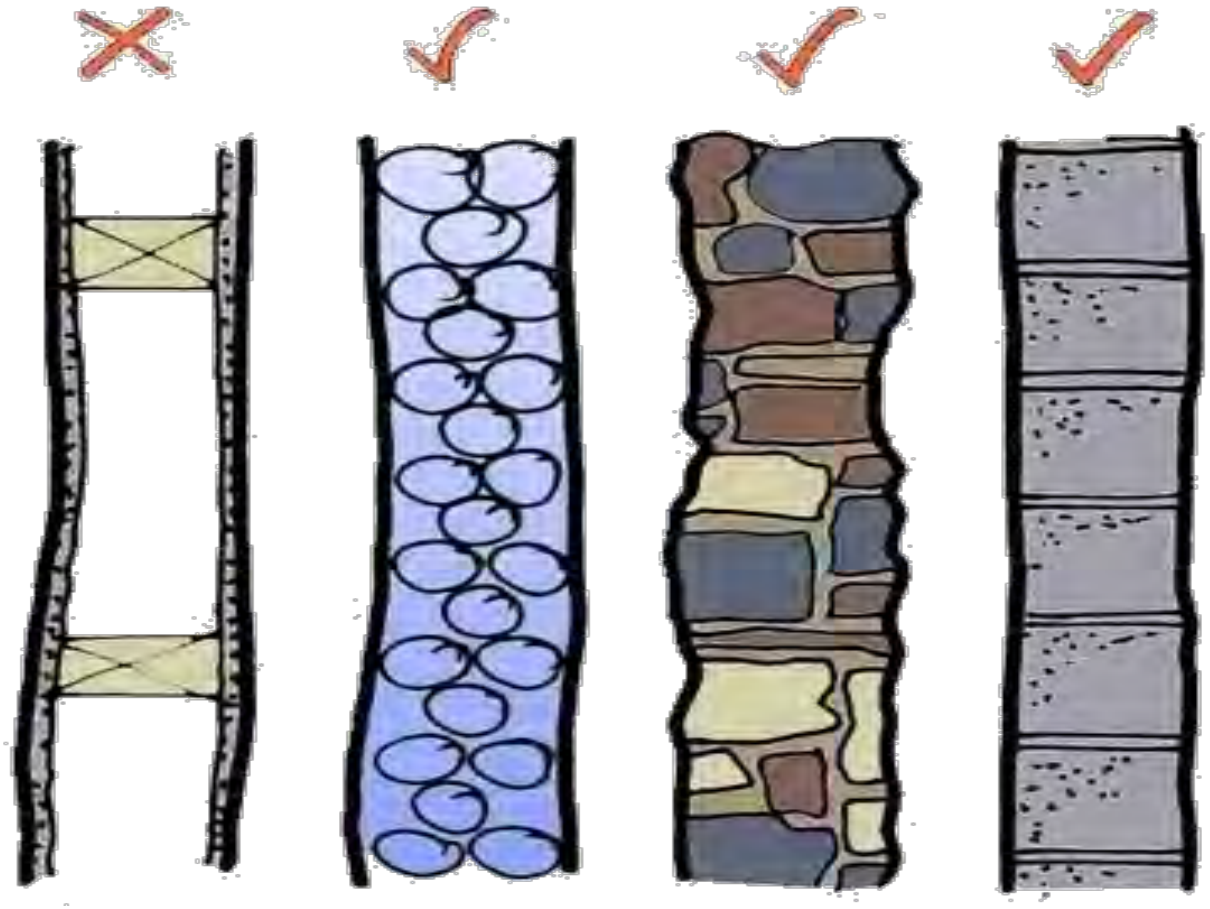
95% CO_2

Thermal Mass Benefits

Thermal Mass Benefits



Materials Used for Thermal Mass



Oregon Health Systems University, Building One, Portland, OR

- Operating cost savings of $600,000 annually
- Downsized systems
- Capital cost savings of $3.2 million

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LEED Credit Category	LEED v4 Points	Concrete Contributes
IP – Integrative Process	1	✓
LT – Location & Transport	16	✓
SS – Sustainable Sites	10	✓
WE – Water Efficiency	11	✓
EA – Energy & Atmosphere	33	✓
MR – Materials & Resources	13	✓
EQ – Indoor Environ Quality	16	✓
ID – Innovation	6	✓
RP – Regional Priority	4	✓
TOTAL	**110**	**74**

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LEEDv4 – Transparency

Recycled Content

Embodied Energy

Local Transportation

Biodiversity Loss

Land Use

EcoToxicity

Environmental

Company

Headquarters

Central Concrete
755 Stockton Avenue
San Jose, CA 95126
866-404-1000

Service Areas cover

Brentwood

Brentwood Plant
11911 Brentwood Boule
Brentwood, CA 94513

Hayward

Hayward Plant
1844 W. Winton Avenue
Hayward, CA 94545

Martinez

Walnut Creek/Martinez P
893 Waterbird Way
San Jose, CA 95126

Pleasanton

Pleasanton Plant
50 El Charro Road
Pleasanton, CA 94588

Environmento

For ekkomaxx™ Cem

CeraTech USA
1500 W. Beauregard St.
Suite 320
Alexandria, VA 22311
Phone: 703.894.1130
Website: ceratechinc.com

Plants Covered: CeraTech lo
77471.

CEMEX

Environment

This Environmental Product Declarati
produced by CEMEX at the Pier 9

Company

CEMEX is a global building materials company that pr
customers and communities throughout the Americas,
produce, distribute, and sell cement, ready-mix concr
than 50 countries, and we maintain trade relationships

Headquarters

CEMEX USA Headquarters
920 Memorial City Way, Suite 100
Houston, TX 77024
(+1) 713-650-6200

NRMCA

Environmental Product Declaration
(EPD) for Concrete

ARGOS

Plants covered in this EPD

Alliance 2901 Hwy 114 Justin, TX 76247	Haslet 1989 Keller Haslet Rd Fort Worth, TX 76177	Richardson 1250 Digital Dr. Richardson, TX 75081
Arlington 6400 New York Ave Arlington, TX 76010	Hurst 3152 Precinct Line Rd Hurst, TX 76116	Saginaw 1037 Jarvis Rd. Saginaw, TX 76179
Coppell 601 N. Hwy 121 Coppell, TX 75019	Irving 3150 Valley View Ln Irving, TX 75038	Southlake 1965 Brumlow Southlake, TX 76092
Downtown Dallas 240 Singleton Blvd Dallas, TX 75212	Lewisville 1225 S. Railroad Lewisville, TX 75067	Southside 6100 Old Hemphill Rd. S Fort Worth, TX 76134
Ft. Worth 680 N. Houston Fort Worth, TX 76106	Mesquite 1718 Bryana Rd. Mesquite, TX 75149	Terrell 103 Metrocrest Way Terrell, TX 75160
Frisco 15050 Hwy 121 Frisco, TX 75035	Prosper 770 S. Dallas Pkwy Prosper, TX 75078	Waxahachie 4109 North Hwy. 77 Waxahachie, TX 75165

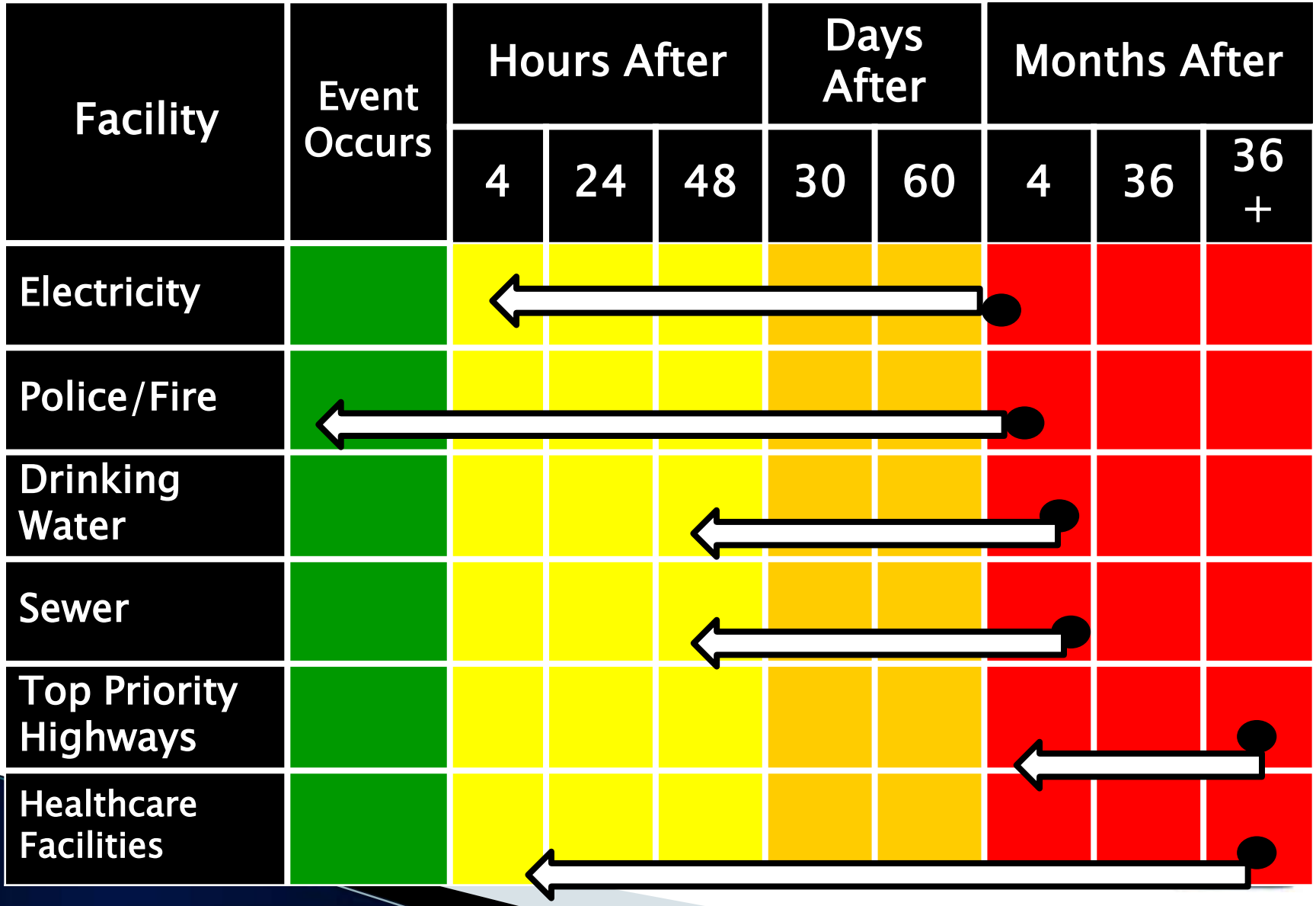
About Argos Ready Mix South Central

Argos Ready Mix South Central, headquartered in Irving, Texas, is a focused concrete supplier serving the major metropolitan market of Dallas – Ft. Worth. From Argos' network of 30 concrete plants concentrated in this area, production is nearly two million yards of concrete annually.

Argos Ready Mix South Central is part of Argos USA Corp., a wholly-owned subsidiary of Cementos Argos S.A., which, in turn, is a publicly traded corporation with headquarters in Colombia, South America. Argos is a member of the Dow Jones Sustainability Indices.

NRMCA CERTIFIED EPD

Oregon Resilience Plan– Feb. 2013



St. Anthony Falls Bridge, MN

Choosing Construction Materials

Brad Moyes
PE, SE, LEED AP
KPFF Consulting Engineers
Principal

Choosing Construction Materials for Building Framing

Structural Materials

- Concrete
  - Cast-In-Place and Precast
- Steel
- Masonry
- Wood

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Code Requirements

- Oregon Structural Specialty Code (Building Code)
- Gravity Forces
- Lateral Forces
- Fire Resistance
  - Building size, use, setbacks
  - Concrete, steel and masonry considered non-combustible

Building Life Cycle Considerations

- Design Life
  - Spec building vs. higher ed
- Future Flexibility
- Use and "feel"
  - Floor deflections
  - Vibration
- Long Term Maintenance

Sustainability Considerations

- **LEED and Green Globes**
  - Choice of structural materials has limited impact on scoring
- **Recycled materials**
- **Local materials**
- **Energy costs are largest driver**

Other Considerations

- Cost
- Schedule
- Material and Labor Availability
- Preference of Owner, Design Team, Contractor

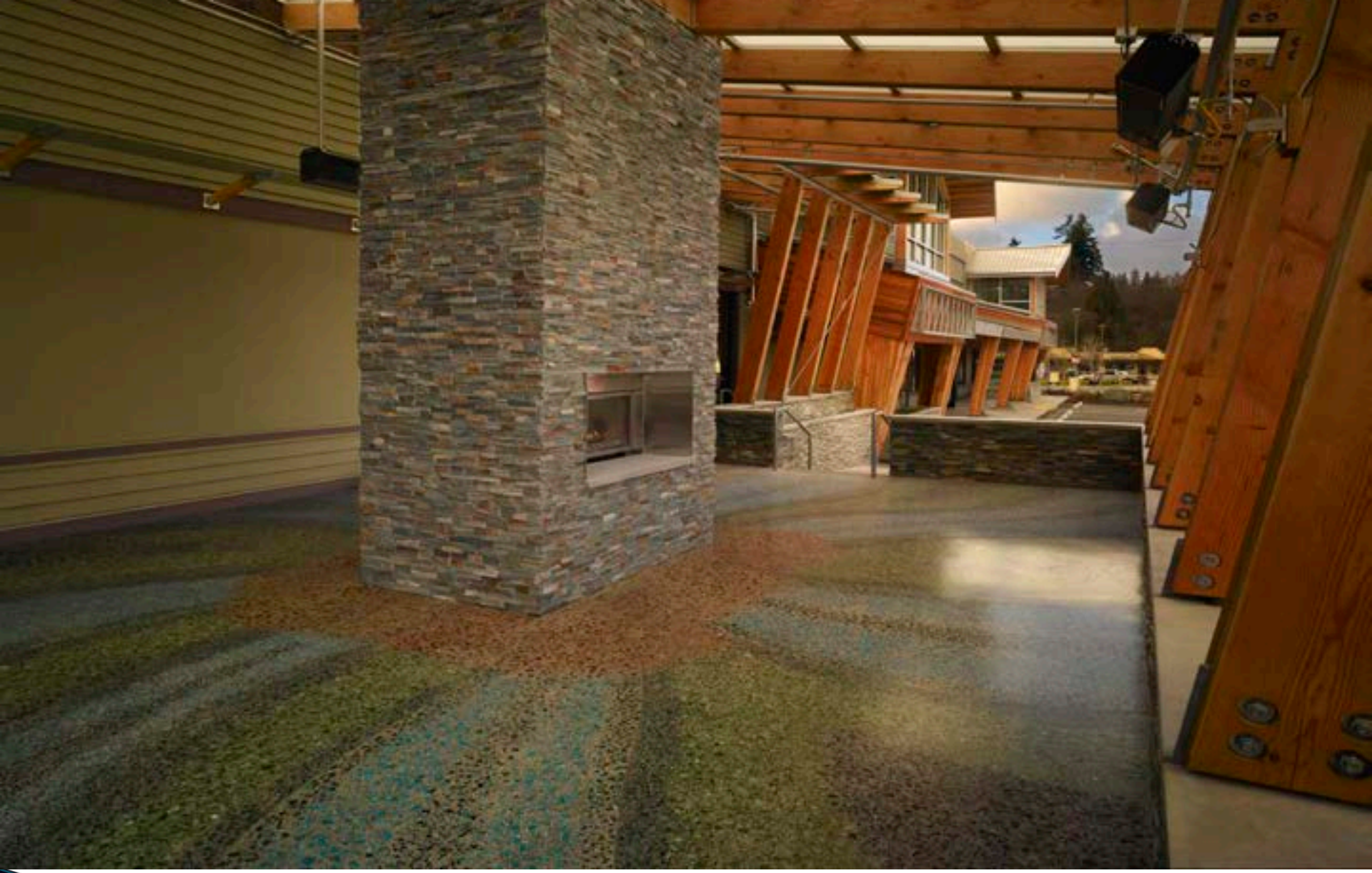
Innovation

Dave Frentress
CalPortland
Marketing Director NW Division


CONCRETE
It's not just for shoes anymore!
Burkhart


ANATOMICAL SCIENCES


JAN 14 2005

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EXIT
EXIT
EXIT


CREW
LEADER


TING
LANE
08/07/2007

ICF … Invisible Concrete Framing

Pervious Concrete

- 15-25% voids
- Allows water to pass through it
- Eliminates storm water runoff
- Recharges groundwater
- Eliminates retention ponds

ASTM 1701?

Industry Challenges & Summary

Rich Angstrom
OCAPA President

Industry Challenges

- Access to an affordable supply of aggregate material
- Speed of permitting material sites
- Training and retaining a skilled work force
- Adequacy of Oregon's Bridges to transport material

www.ocapa.net

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