DECONSTRUCTION AND RE-USE: RETURN TO TRUE RESOURCE CONSERVATION AND SUSTAINABILITY

- **Ron Webster, PCKM**
- **Tom Napier, USACERL**
  - **Steve Cosper, USACERL**

ACM

Sustainability: A Business Imperative

- Midcourse Correction: Towards a Sustainable Enterprise: The Interface Model
- Believing Cassandra: An Optimist Looks at a Pessimist's World
- The Ecology of Commerce: A Declaration of Sustainability
- Natural Capitalism
- The Natural Step for Business: Wealth, Ecology and the Evolutionary Corporation
- Dancing with the Tiger: Learning Sustainability Step by Natural Step
- Cool Companies: How the Best Businesses Boost Profits and Productivity
- Lean Thinking: Banish Waste and Create Wealth in Your Corporation

ACM

The Natural Step

- (1) Substances from the Earth's crust (the lithosphere) must not systematically increase in the ecosphere
- (2) Substances produced by society must not systematically increase in the ecosphere
- (3)Nature's functions and diversity must not be systematically impoverished by physical displacement, over-harvesting, or other forms of ecosystem manipulation
- (4)Resources must be used fairly and efficiently in order to meet basic human needs worldwide

ACM

Henry Ford: Today and Tomorrow 1926

- Waste: lost opportunity ("opportunity cost") and failure
- "Waste hatred": shop rags, steel, wood, anything getting away

- Lived the four principles, including environmental and generational equity
- Workers could buy the cars they built
- Commonly doubled prevailing wages at business acquisitions
  - glass, steel foundries, steamshipping, mines, etc.
- "Human capital" joined "economic capital" and "natural capital" : "triple bottom line"
- Cost savings shared: stockholders, employees, customers: survival in the long term
- Broader interest in cohort systems and future system

ACM

Today and Tomorrow

- ."…meeting the needs of the present without compromising the ability of future generations to meet their own needs" (WCED - World Commission on Environment and Development

ACM

The Elimination of Regulation

- Swift Packing Company
- “sheen” on the water: “lost product”

- Ford charcoal briquet process: wood scraps “getting away”
  - E.K. Kingsford helped along the way

- Regulation as an indication of business failure
- Cradle to Cradle: Remaking the Way We Make Things

- These were not pansies.
- Ford was not a “greener”.

ACM

Built to Last: Successf of

- Little value in “charismatic leader
- Long-term success: broad vision; operating principles
- Nothing to do with profit, but “doing the right thing”

- Nike: “ Just Do it” to Do the right thing”

- Merck: “our medicine is for the patient……the profits will follow”.
- Ford Motor Company: employees and automobiles, profits a by-product

- Companies “built to last”

ACM

Acceptance of Waste Streams: A New Business Principle?

- World War II-era (and younger) buildings
  - 50 Million square feet)
  - Demolished at $7 per square foot
  - Landfilled at approximately $30 – 50 per ton ($1 Million/acre)

- Typical 2-story WWII barracks
  - Generates 300 tons of debris
  - Effective landfill costs: $12,000 to $20,000 per building

- Demolition and disposal: major cost elements of building removal
  - 85% of the solid waste burden
  - Diminishing landfill capacities
    - $30 to $90 per ton of debris in the near future

ACM

Wastes (Costs) to Resources (Income)

- Deconstruction: emerging practice
  - Positive results: 50% to 90% recovery
  - Takes longer than simple demolition
  - Salvages 3 - 5 square feet of building per labor-hour
  - Manual deconstruction: $5 to $6 per square foot
  - $3 for conventional demolition (without hauling and disposal costs)

ACM

Wastes to Resources (cont.)

- Salvaged materials sold (wholesale) 25% of their retail value (new)
  - If retailed directly, 50%
- Non-profit organizations
- Non-manual methods and techniques
- Economically competitive with conventional demolition, if all costs considered

ACM

“Waste can be eliminated as a concept”

- McDonough, William, and Braungart, Michael, Cradle to Cradle: Remaking the Way We Make Things

ACM

Army Buildings: Which Paradigm?

- “Bash and trash” has sometimes been abandoned

- Fort McCoy sells surplus buildings to the highest bidders
- 140 buildings over the last 10 years, saving $3.5 Million

- Fort Knox uses similar process
- 285 buildings over three years, $250,000 in income through recycling
- saving roughly $640,000 in demolition costs.

ACM

National Association of Homebuilders

- Commercial viability of deconstruction (four metropolitan areas}
- “A Report on the Feasibility of Deconstruction”

- Military installations: greater economic opportunity for economic deconstruction

ACM

Army wide: enormous opportunity

- Lumber: predominant building material in the 40’s, 50's, and 60's
- Good condition, though often appearing rundown
- Most components are usually recoverable
- Given some 50 million SF of wooden buildings to be removed
- over 200 MILLION BF of lumber

ACM

Opportunities

- -Tongue and groove flooring
- -Original and replacement windows
- -Steel and solid core doors with hardware
- -Asphalt shingles that can be recycled
- -Metals .
- -Heating systems
- -Acoustic ceiling systems
- -Recently installed furnaces
- -Water heaters
- -Plumbing fixtures
- -Electrical hardware
- -Lighting fixtures
- -Electrical wiring, piping, ductwork, boilers, etc.

ACM

“The largest existing stand of growth f

- “Old-growth lumber”-- denser, with tighter growth rings
- Higher grade wooden siding
- Unavailable at any price

ACM

Army promotes reuse or salvage of

- Assistant Chief of Staff for Installations and Management (ACSIM)
- "…to ensure that materials removed from demolished structures and waste materials generated during new construction are either salvaged for resale, reused on site, or recycled in lieu of being disposed in a landfill or incinerated, when economically feasible.

- The Unified Federal Guide Specifications (UFGS)

ACM

Impediments: Hurdles in the Path

- General Practice
- Familiarity with the Market
- Economic Factors
- Scheduling
- Contracting
- Real Property Transfer
- Lead-Based Paint
- Other Hazardous Materials

ACM

Recommendations

- Education and awareness
- Total system economic analysis and decision
- Identify local salvage and deconstruction capabilities
- Adjust demolition schedules and procurement times
- Should not require demolition debris be placed in the installation landfill
- Allow recovery or salvage
- Identifying comparative extent and nature of resultant pollution
- Clarify regulatory and statutory requirements

ACM

Successf

Ef

- www.smartgrowth.org/library/waste_mgmt_update_4.html
- www.ciwmb.ca.gov/ConDemo/CaseStudies/Presidio/default.htm lwww.smartgrowth.org/pdf/deconstruction.pdf
- www.conversion.org/cec/dsrr.pdf
- www.ilsr.org/recycling/deconatwork.html
- www.cce.ufl.edu/past/deconstruction/reuse.html

- Used Building Materials Association (UBMA) (See http:// www..ubma.com)
- Reuse Development Organization (See http://www.redo.org)

ACM