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

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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
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
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
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
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”. 
Built to Last: Successful

- 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”
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
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)
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
“Waste can be eliminated as a concept”

- McDonough, William, and Braungart, Michael, Cradle to Cradle: Remaking the Way We Make Things
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.
• Commercial viability of deconstruction (four metropolitan areas)
• “A Report on the Feasibility of Deconstruction”

• Military installations: greater economic opportunity for economic deconstruction
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
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.
“The largest existing stand of growth f

• “Old-growth lumber”-- denser, with tighter growth rings

• Higher grade wooden siding

• Unavailable at any price
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)
Impediments: Hurdles in the Path

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

Ef

- www.smartgrowth.org/library/waste_mgmt_update_4.html
- www.ciwmb.ca.gov/ConDemo/CaseStudies/Presidio/default.htm
- www.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)