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Defining Sustainability In Construction and Development

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"It's not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change."
Charles Darwin

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The Sustainability 'Fad' Is MAJOR Business

- Going on now for over 10 years
- Fortune 500 companies 'buying' in
- Investors are driving companies to produce 'Corporate Responsibility' Reports
- Combining energy, mining, steel, food, beverages, and media, the companies leading in implementing environmental, social, and governance policies have outperformed the general stock market by 25% since August 2005 *(McKinsey&Company)*
- 72% of these companies have outperformed their peers over the same period *(McKinsey&Company)*
- State and Federal laws addressing climate change are generating CO2 Cap & Trade markets
- 90% of CEOs are incorporating environmental, social & governance into strategy & operations *(McKinsey&Company)*

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Can Sustainability Be Profitable For Developers and Contractors?

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Common Arguments Against Sustainability

Developer

- Difficult to obtain certification
- Failure of ‘green’ designs to deliver expected results
- Full scope of risks are unknown

Contractor

- It costs more
- Delays caused by lack of availability of ‘green’ products
- Unexpected delays caused by LEED processes

Sustainability Is An Approach
Goal: Seamless Integration of Activities

- Engineering
- Operations
- Construction
- Marketing

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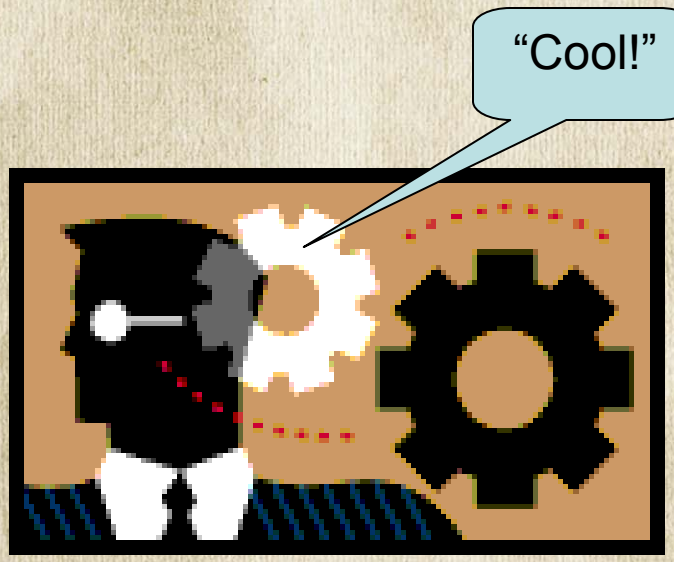
Understanding Sustainability

- **Sustainability is NOT:**
  - Additional overall project costs (cost neutral)
  - Additional design and construction risk
  - Additional project liability
- **Sustainability IS:**
  - Proactive
  - Understanding the business issues (water rates, O&M costs, etc.)
  - Saving money
  - Being good stewards of the environment

How Is *Engineering* Sustainability Defined?

Minimizing Consumption & Costs!

- Water Efficiency
- Energy Efficiency
- Material Reuse



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Sustainability is a Progressive Process
Incorporating it in to everything we do

- A more holistic approach to determining solutions
  - Construction waste and water sources
  - Re-thinking design standards
  - Using optimization tools

- Exposing both field and office staff to what *Sustainability* means
- Lifecycle assessment approach
  - Initial capital cost is not the ONLY factor
  - Higher initial capital costs can be justified with:
    - Energy & water savings
    - Acceptable payback periods
    - Ease of adaptability to future legislative changes

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Shifting Our Thinking For 'Best' Alternative

- *Lowest Capital Cost solution is not necessarily the answer*
- *Change to the immediate response and reaction to price and meeting 'budgets'*
- *'Unregulated' VE can wipe-out sustainable designs*
- *Cost estimators versed in O&M costs*

"Price is only one component of value"
Fortune Small Business Magazine – July 2008

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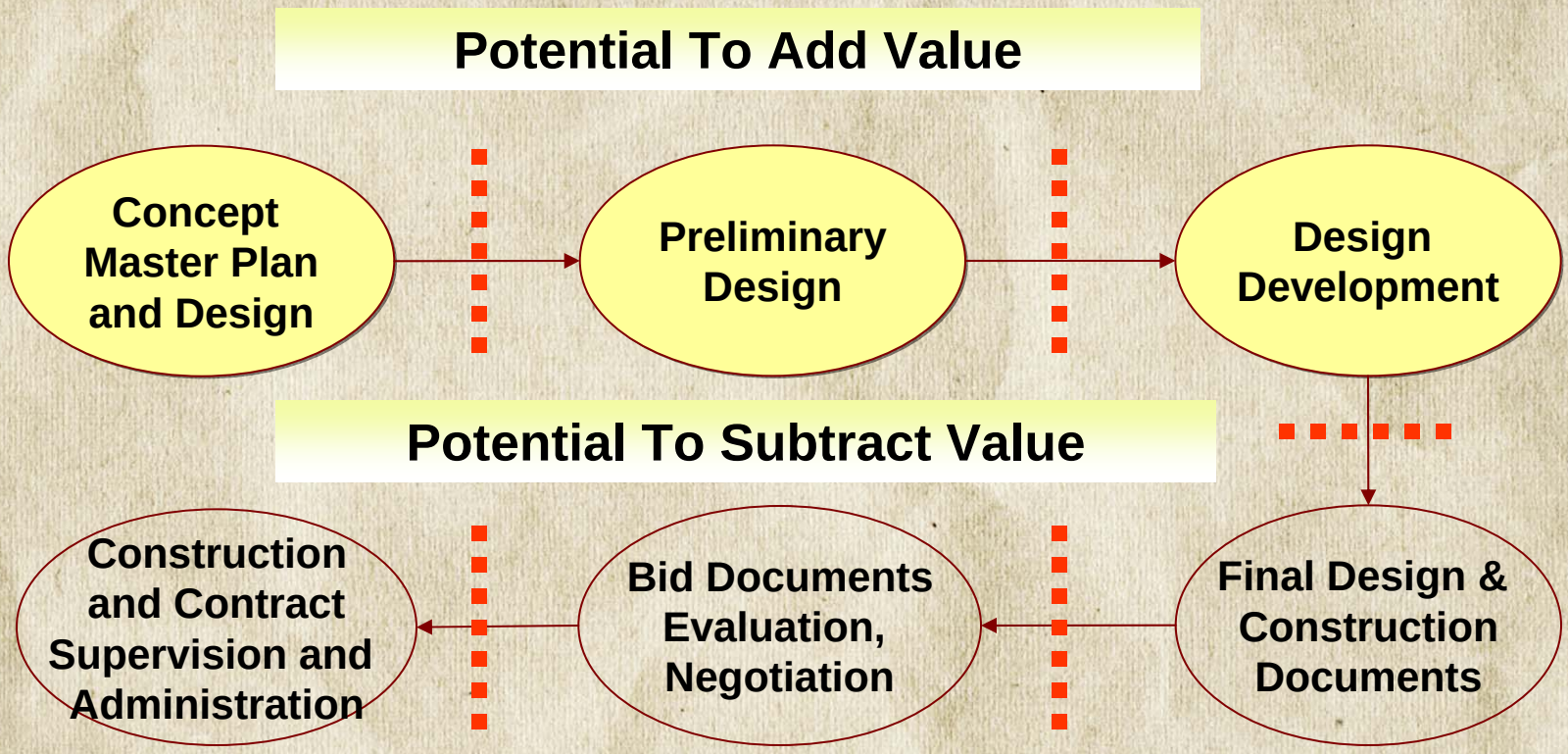
Sustainability: Values Can Be Added And Subtracted



Review and check of sustainability criteria, goals and objectives

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With The Right Contractor and CM, Change Orders Can Be Good For Business!

- Sustainable solutions and alternative thinking provided and presented to Owner/ Water Agency /Developer
- Contractor and/or CM provide excellent opportunity to implement change
- Alternatives with lifecycle cost assessments presented during time of change orders
- Contractors become the solution to sustainability instead of a barrier

What Does The Marketplace Really Need and/Or Want?

- Reliable designs, quality projects
- Designs that will not be obsolete once construction completed
- Alternatives where Net Present Value, payback, and life cycle costs are understood by decision makers
- Carbon footprint impacts and potential profits from buying/selling offsets understood

Why is Sustainability Important for the Developer?

- Using cost effective materials → Competitive pricing
- Marketing Edge
  - "Green" Building is a major marketing tool
  - Growing public concern about global warming & the environment has lead to greater public awareness
- Your competitors are employing sustainable practices
- Good sustainable designs → Reduced end user energy consumption
  - Higher initial capital costs can be justified by reduced electricity consumption and overall lifetime savings

Developer Case Studies

- Developer in the High Desert using recycled Styrofoam & concrete to build homes

- A developer fired an architect for refusing to incorporate insulated concrete into his designs

Why is Sustainability Important for the Contractor?

- Changing government regulations
  - California recently adopted ‘Green Building Standards’… many states soon to follow
- Clever use of ‘waste’ materials can reduce costs
- Reusing ‘waste’ materials can decrease installation time (no waiting for material delivery)
- You will be outbid by others who think and operate sustainably

Contractor Case Studies

- A contractor was the low bid on a WWTP expansion because he was the only one who thought of reusing a concrete wall
- One Contractor's waste is another Contractor's treasure… Contractor purchased rejected material from a nearby project and used it to reduce costs on his project. Bought materials for 1/3 the price

How Can A Developer Incorporate Sustainability Into Projects?

- Know the sustainable practices that sell to your market before you design & construct
- Demand cost effective sustainable solutions from engineers/ architects
- Understand upcoming legislative restrictions and/or building code changes
- Realize the impacts on sustainable infrastructure that your project generates

How Can A Contractor Incorporate Sustainability Into Projects?

- Sustainability strategies
  - Efficient trailers
    - Equipment
    - Increase R-value
    - HVAC -consumes about 2/3 of trailer electricity
  - Construction activity optimization
  - Evaluate lighting for graveyard shifts
  - Replace under-performing equipment
- Keep in touch with your competitors - barter
  - Off-spec materials
  - Exchange ‘waste’ materials between project sites
- Lifecycle analysis
- Field/Working Conditions
  - Reusable water bottles
  - Equipment fuel consumption
- Office Behaviors
  - Document organization on server
  - Emails and attachments

Understanding Sustainability Value During Construction

- Are lifecycle and payback calculations always offered with change orders and/or recommendations?
- Are HVAC commissioning activities provided?
- What energy efficient technologies are used?
- Are GHG calcs and CO2 emissions provided in the alternative analysis and decision making process?
- Which renewable energies are appropriate based on criteria, pricing structure, and where on site?
- Are the facilities designed for the future (conduits to roof, windows, etc.)?
- Are the benefits of SW BMPs (GW recharge, removal of SW treatment, etc.) provided and/or considered?

Sustainability is Everyone's Responsibility

Owner/Public Agency

- Receptive to change orders
- Allows for design deviations
- Open to alternative solutions

Developer/Contractor

- Evaluate new technologies, subs, means, & methods
- Generate & advocate an understanding of fundamental issues at stake
- Open to innovative ways of doing things
- Question 'standard' practices
- Understand changing regulations (UBC Code, Carbon Footprint Legislation, etc.)

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