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***Presented By***

***Carlos Rivero-deAguilar***

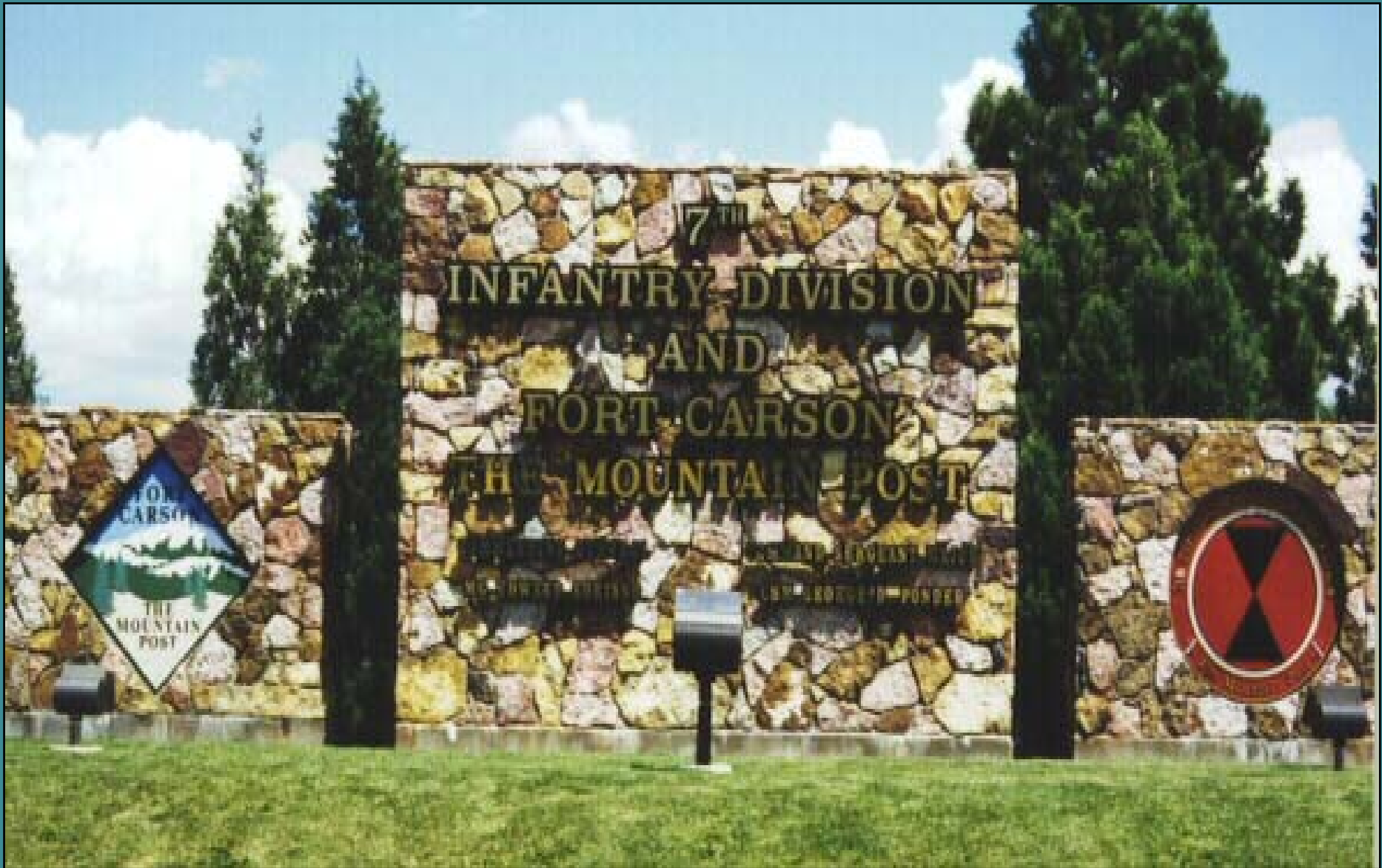
***&***

***Rob Ford***

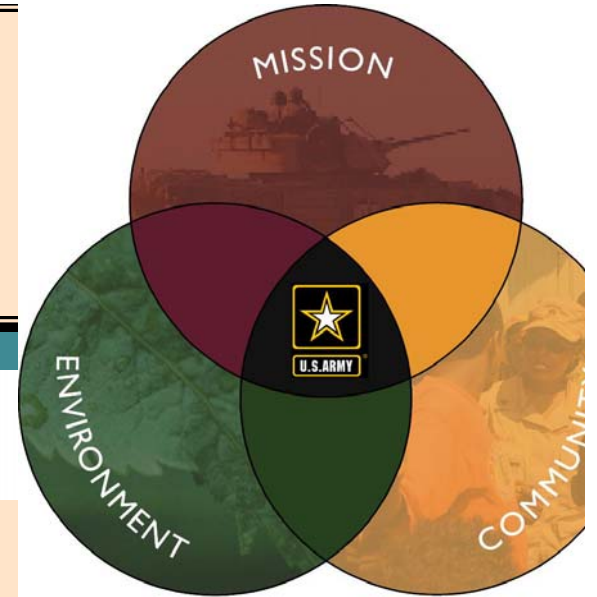
**JSEM 2006**

**Denver, CO**

**March 23, 2006**



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“Using resources to meet the needs of the present without compromising the ability of future soldiers to meet their mission.”

# A Sustainable Fort Carson...

*Well Being*



*Economy*

*Society*

True Power V

## ***“Sustainability and Environmental Management System”***

### **■ EMS**

- Management system designed to ensure/enhance environmental **performance**, ISO 14001

### **■ SEMS**

- Based on EMS structure
- Drives Fort Carson’s progress toward sustainability
- Everyone’s daily job responsibilities
- improve efficiency and save \$

# Uhxow=#DfwyW|#p sdfw#Jdqnlbj

- **Waste Management / Demolition (Solid waste)** 176
- **Vehicle and Equipment Maintenance (Refueling)** 162
- **Supply and Procurement**
- **(Supply and services selection)** 162
- **Vehicle and Equipment Maintenance (Painting)** 144
- **Food Service**
- **(Procuring and Transporting Food and Supplies)** 144
- **Training (Collective unit training)** 140
- **Construction (Construction/Renovation)** 140
- **Vehicle and Equipment Maintenance**
- **(Repair/Preventive maintenance)** 132
- **Vehicle and Equipment Maintenance (Storage)** 128

## Edfnj urxqg

- *Fort Carson Sustainability Program Vision to Reduce Waste Leaving the Installation to Zero by 2027*
- *Construction and Demolition Debris Leaving Installation Comprised ~ 60-70% of All Solid Waste*
- *DECAM, DPW, Innovar, e<sup>2</sup>M, Second Chance Deconstruction, and USACE CERL Collaborative Effort to Reduce Waste*

# Sxurvh

- ***Collect and Report Data***
    - *Volume of Materials Diverted from Landfill*
    - *Harvest Rates*
    - *Potential Market Value*
  - ***Determine if Deconstruction is a Feasible Building Removal Practice on Fort Carson***
  - ***Lay Foundation for Incorporation of Deconstruction Language into Building Removal Contract Architecture***
- 

## Exlog by #Whofwtrq

- ***Based on the Following Criteria:***

- *Schedule for Removal*
- *Building Types to be Removed*
- *Environmental Hazards Removed or Reduced*
- *Significant Number of Building Types Remaining*



*Building 6286*



*Building 227*



## Exloglog #95 ; 9



- *WWII Era Administrative Building*
- *13,128 ft<sup>2</sup> Single-story*
- *Concrete Masonry Unit (CMU) Exterior*
- *2" x 4" Studs, Wood and Sheetrock Interior Partition Walls*
- *2" x 12" Floor Joists*

# Perth & Ingv

- *18,000 Linear Feet of Reusable Lumber*
- *23,724 Pounds of Wood Mulch*
- *550 Pounds of Copper*
- *~ 600 Glass Blocks*
- *30 – Cubic Yards of CMU Block*
- *Cost to Machine Demolish versus Deconstruct Similar ~\$ 6 ft<sup>2</sup>*



## Exloglog #55 :



- *WWII Era Warehouse Building*
- *Single-story 10,000 ft<sup>2</sup> Structure*
- *Wood Construction, ~ 1,500 ft<sup>2</sup> of Partitioned Interior*
- *Lead Based Paint*

## On-going Edvng#Sdlbw#Q rwh

- *Performed Lead Based Paint Exposure Assessment on Personnel Removing Lap and Vinyl Siding*
- *Fifty Percent Came Out Non-Detect*
- *Other Fifty Percent of Samples Ranged Between 2.36 ug and 7.0 ug Lead/m<sup>3</sup>*
- *OSHA Action Level for Lead is 30 ug Lead/m<sup>3</sup>*

# Providence High

- *28,618 Linear Feet of Lumber Harvested and Reintroduced*
- *58 Tons of Material Diverted From Landfill*
- *5,246 Pounds of Ferrous Metals Diverted*
- *~ 90% of Building Materials Reused or Recycled*



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## *Fort Carson Golf Course Club House*



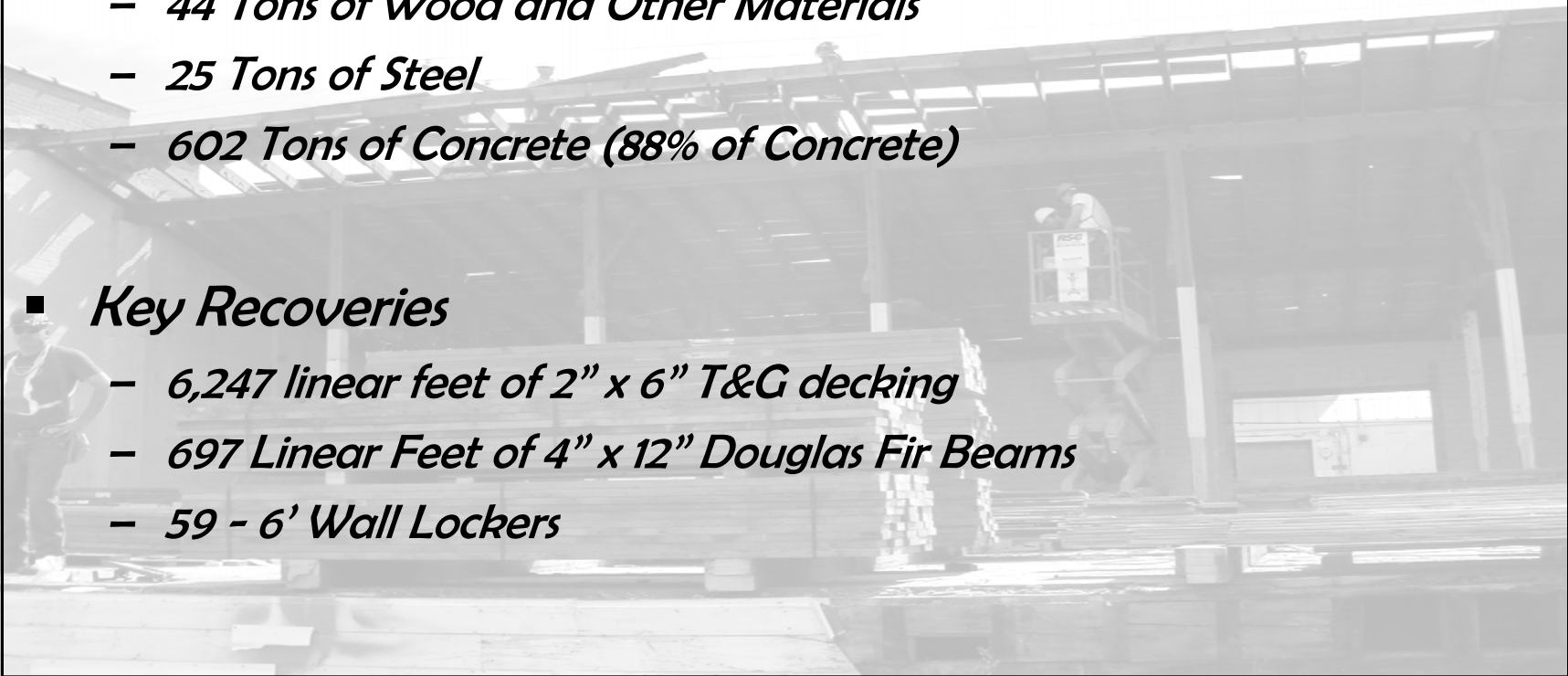
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- ***Recycled 85% of Recyclable Materials By Weight***

- *44 Tons of Wood and Other Materials*
- *25 Tons of Steel*
- *602 Tons of Concrete (88% of Concrete)*

- ***Key Recoveries***

- *6,247 linear feet of 2" x 6" T&G decking*
- *697 Linear Feet of 4" x 12" Douglas Fir Beams*
- *59 - 6' Wall Lockers*



## Summary of Key Findings

- ***Contracting Mechanism is Major Criterion to Be Considered***
  - *Service Contract Act and Davis-Bacon Act Wages Can Be Cost Prohibitive*
  - *Volunteer Labor or Free Labor for Material Salvage Best Alternative*
- ***Local Used Material Building Market Must Be Viable***
- ***Clear Used Material Reuse or Recycle Plan Must Be Established Prior to Commencing Project (e.g., Site Specific Solid Waste Management Plan)***



## Vxp p duj

- *Fort Carson Staff and Local Contractors Successful at Using Deconstruction as Building Removal Techniques*
- *Full Deconstruction is Viable for Wood Buildings and in a Limited Capacity on CMU Exterior Buildings (Installation Rock Crushers May Improve Viability)*
- *Installation Building Removal Practice and Culture Permanently Changed*
- *Lead-based Paint of Minimal Concern in Regard to Removal*
- *Fort Carson Implemented New Contract Language That Encourages and Establishes Goals for Deconstruction*

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- ***Department of the Army Assistant Chief of Staff for Installation Management (ACSIM) issued guidance on 6 February 2006 stating:***
  - *“All military construction, renovation, and demolition projects shall include contract performance requirements for a 50% minimum diversion of construction and demolition debris, by weight, from landfill disposal”*
- ***Applies to all unawarded contracts and solicitations issued on and after 6 March 2006.***

Dqrwkh#G hfrqwxfwlrq#F rqrhsw

- *Consider using salvaged wood and other reusable building materials as:*
  - *Class IV construction materials for training exercises, or other training uses;*
  - *Force Protection construction materials in support of the Global War on Terrorism*
  - *New building materials used in the reconstruction efforts in Afghanistan and Iraq*

**T xhwtrqvB**

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