SCS ENGINEERS

Managing Large Quantities of Post-Disaster C&D Debris

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Overview

- Disaster debris classifications
- Landfill ramifications
- Disaster planning

Disaster Classifications

- Hurricanes
- Tornados
- Floods
- Fires
- Earthquakes

- Much of debris is
  - Soil, building materials, vegetative waste

Hurricanes

- Building Material
  - Residential vs. Commercial
- Sediments/Soil
- Vegetative Waste
- Personal Property
  - Appliances
    - White Goods, E-Waste
  - HHW

Tornados

- Building Material
  - Residential vs. Commercial
- Vegetative Waste
- Personal Property
  - Appliances
    - White Goods, E-Waste
  - HHW

Floods

- Sediments/Soil
  - Sandbags, reinforcing materials
- Building Material
  - Drywall, insulation
- Personal Property

Fires

- Ash
- Burnt wood
- Personal Property
- Metal
- Concrete
- Soil

Earthquakes

- Building Materials
  - Residential vs. Commercial
- Personal Property
  - Appliances
- Infrastructure
  - Concrete
  - Asphalt

Landfill Ramifications

- Depletion of disposal capacity
  - May double + annual disposal
    - Hurricane Isabel ~10M CY in MD/VA
  - Total capacity and individual cells
- Increased equipment needs
  - Compaction equipment
  - Increased working face
- Increased personnel requirements
  - Longer hours
  - May need to import workers

Landfill Ramifications

- Spike in gas generation
  - Increase in organic materials and moisture
  - Drywall ➡ H_2S
- Change in debris type and density
- Landfill operations impacts
- Health & Safety
- Documentation!

Landfill Operations Impacts

- Additional equipment operators
  - Training for landfill operations
- Increased traffic
  - Queuing problems
- Landfill compaction
- Material screening

Landfill Operations Impacts

- Daily cover needs
- Increased leachate generation
- Change in leachate characteristics
- Slope stability and landfill settlement
- Existing infrastructure protection
  - Monitoring wells
  - Extraction wells

Health & Safety

- Unfamiliar site users/operators
- Increased urgency to operations
- Material screening
- Increased traffic
- Personnel fatigue
- Hot loads – Fires
- Long working hours
  - Darkness/lighting

Documentation

- Material types
  - Disposed vs. diverted
- Material amounts
- Disposal location
- State vs. Federal requirements

Disaster Planning

- Space planning
  - Disposal location
    - Avoid sideslopes if possible
- Disposal capacity
- Maintenance of permit grades and elevations
- Material types and treatment
- Material separation/segregation

The Goal

- Avoid the disaster after the disaster