



# Managing C&D Materials from Job Sites to Infrastructure: Waste Diversion, Resource Recovery, and Colorado C&D End-Markets

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# AGENDA

Introductions

Industry Sectors

Materials

Collections

End Markets

## Managing C&D Materials from Job Sites to Infrastructure: Waste Diversion, Resource Recovery, and Colorado C&D End-Markets



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VERT Sites LLC



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Circular Colorado

Breakout Session at the Summit for Recycling  
May 22nd



**CIRCULAR**  
COLORADO

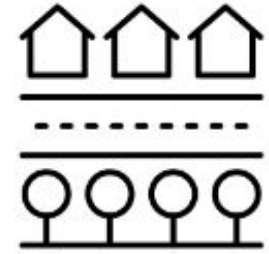


# INDUSTRY SECTORS



# Industry Sectors

## RESIDENTIAL

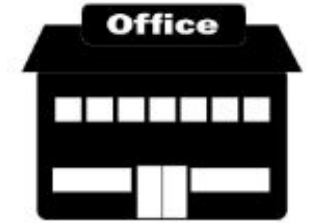


Custom homes, home remodels, apartments, condominiums, developments.



# Industry Sectors

## COMMERCIAL



Restaurants, shopping centers, offices and office centers

## ALSO...



Hospitals, schools, and government institutions



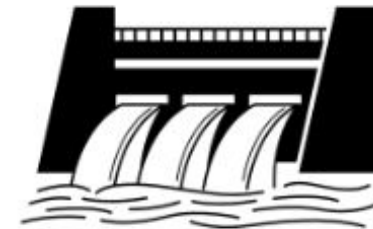
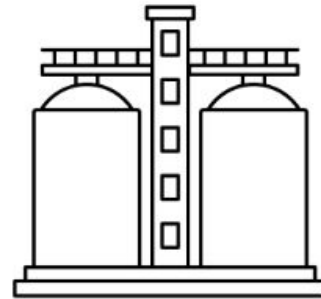
# Industry Sectors

## CIVIL



Planes, trains, and automobiles...

## ALSO



Water supply systems, sewage, public utility works



# Industry Sectors

## INDUSTRIAL



Nuclear, manufacturing, Oil & Gas, petrochemical, renewables, mining, and agriculture

**sector projects  
are you  
experiencing in  
your  
community?**



# INDUSTRY MATERIALS



# Materials





According to the  
**2019 Recycle  
Colorado C&D  
End-Market  
Report**, which  
C&D material  
categories are  
experiencing  
recovery and  
diversion  
challenges in  
Colorado?





# Materials

*Common  
materials  
found at  
residential  
projects*

*What else?*





# Materials

*Common materials found at commercial projects*

*What else?*





How many  
material  
streams are  
pictured  
above?

**What are some  
sector materials  
you're seeing at  
local job sites?**

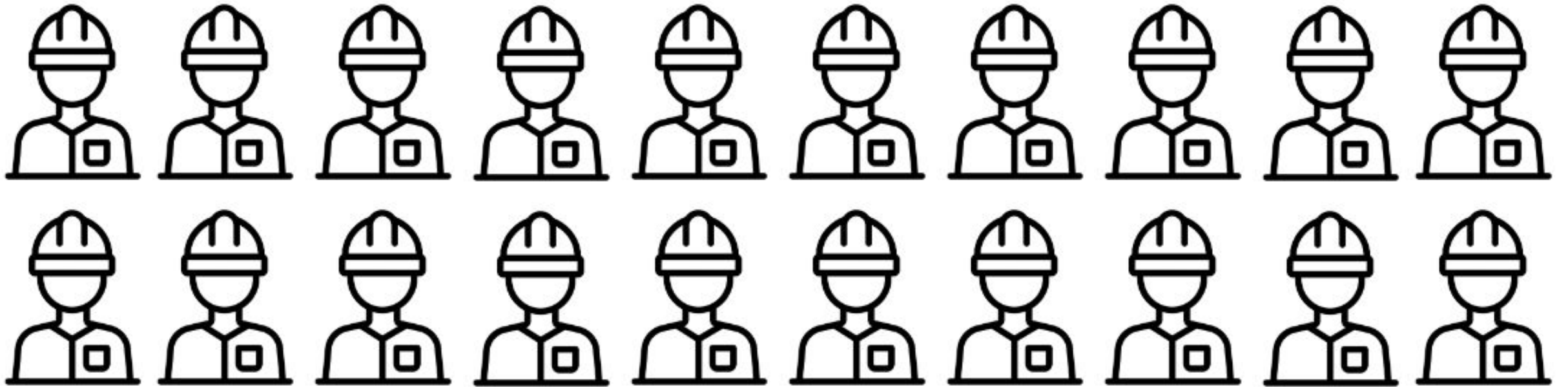


# MATERIAL

## How hard can it

# COLLECTIONS

be?





# COLLECTIONS

## CHALLENGES

- Regulations
- Illegal dumping
- Space
- Transportation
- Communication
- Disposal
- Enforcement
- Cost

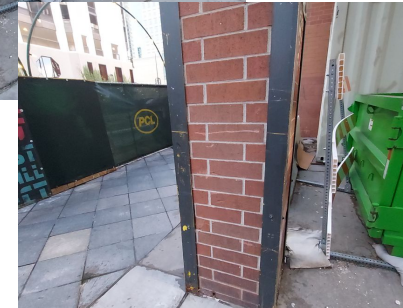
# COLLECTIONS

## CHALLENGES

- Space
- Illegal dumping
- Regulations
- Transportation



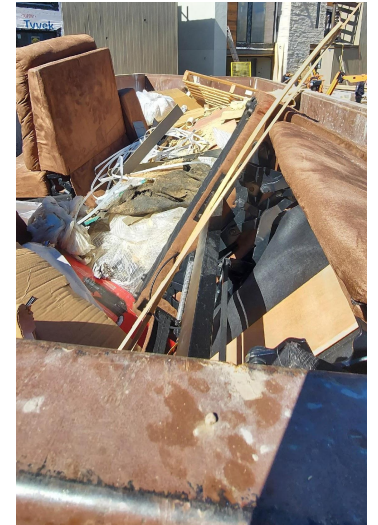
Space/Regulations/Transportation:  
neighborhood



Space/Transportation: City/urban  
area



Transportation



Illegal Dumping

# COLLECTION

## CHALLENGES



- Communication
- Disposal
- Enforcement
- Cost



# COLLECTION CHALLENGES



## Deconstructi on

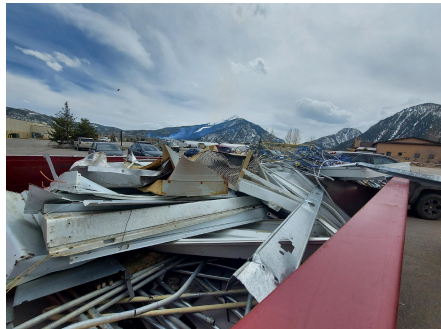
The systematic disassembly of a structure to recover materials for reuse.



# COLLECTIONS SUCCESSES



OCC only recycling.  
Residential development.



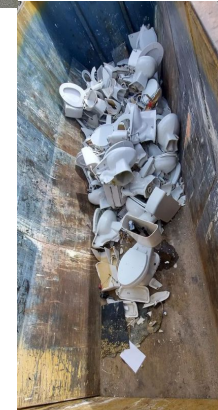
48,000 pounds of scrap metal. Hotel remodel.c



215 mattresses. Hotel remodel.



CFL bulb  
recycling and  
other HHW  
materials.  
Hotel  
remodel

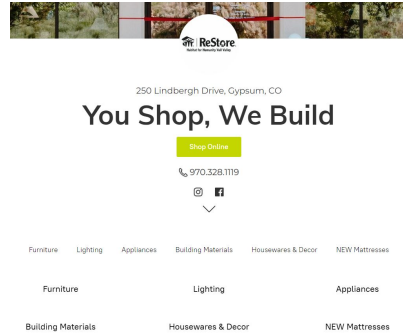


***Success or  
Failure?***

# COLLECTIONS SUCCESSES



Resource Central.  
Boulder.



Habitat for  
Humanity.  
Eagle  
County/Vail  
Valley



Contractor-Contractor



Motherlode  
Mercantile. Pitkin  
County Solid  
Waste Center.



Bud's Warehouse.  
Denver.



Deconstruction

# Success Questions

## Sector

- Does the job site have a Materials Management Plan specific for the sector industry, project, and project location?
- Are subcontractors aware of any sort of Materials Management Plan?
- What are the local limitations of waste diversion? What is easily divertible and manageable to divert?

## Materials

- What is the job site's material inventory?
- Will the project experience consistent material generation of material streams and products, ebbs-and-flow of material generation, special waste streams?

## Collections

- Where are the materials being collected on the job site?
- Who is hauling the materials on the job site?
- Who is hauling the materials to disposal sites?
- What equipment is needed to collect materials, e.g., rolloff, dumpster?
- What vehicle(s) are needed to remove equipment?

# Thank you

## Contact info

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## C&D Services

- Materials Management Plans: Construction, Demolition, Deconstruction, and Remodels
- Salvage assessments
- Material stream audits
- Contamination assessments
- Education and trainings (staff and trades)
- Diversion reports





# End Market Solutions for C&D

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# End Markets

Steps in creating an  
end market for C&D  
Materials

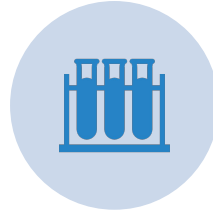


# Critical parts of C&D end market solutions

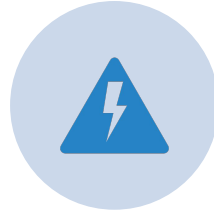
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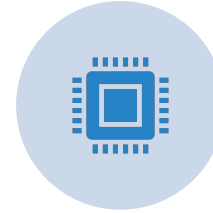
MATERIAL  
COLLECTION



TESTING



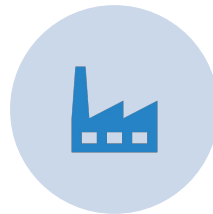
PERMITTING



PROCESSING



TRANSPORTATION



MANUFACTURING



SALES



DISTRIBUTION





Brick



Concrete



Dirt



Drywall



Metals



Mixed Debris, including non-recyclable...



Cardboard/OCC



Mixed Plastics



Rocks



Wood



Glass, Porcelain, Tile, Ceramics



Shingles





# Collection

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## No C&D Recycling Center

- Provide a dedicated container
- Does it need to be sealed or contents protected?
- Is there sampling/testing required onsite?

If sampling is required, how many/often?

- Does material need to be bagged or packaged?
- Does it require any special handling or certified staff to handle or transport?

## C&D Recycling Center

- Mixed C&D container goes to sorting facility
- Separated material is tested if required
- Material is transported to end user

# Testing Protocols



## Asbestos Inspection and Sampling Protocol

**Project Summary**  
EnviroSpec, LLC (EVS) is pleased to provide Scrapzero an Asbestos Inspection and Sampling Protocol for the purpose of recycling new construction drywall scraps into their proprietary gypsum products. Inspection & Sampling new construction drywall scraps is necessary to determine asbestos content. This protocol will outline the inspector requirements to conduct the asbestos inspection and sampling techniques as required by the Colorado Department of Public Health and Environment, Regulation 8.

**Asbestos Inspection**  
EVS proposes to collect samples from within a clean (not previously used for asbestos containing waste) 30-yard Recycling dumpster at the jobsite the new construction drywall was scrapped. EVS will determine if the new construction scrapped drywall has surfacing texture and/or joint compound. If there is no surfacing texture EVS will collect three miscellaneous materials samples per homogeneous drywall. In order to collect random samples from within a 30-yard dumpster, EVS recommends collecting samples when the dumpster is half full and again when the dumpster is full. EVS will determine homogeneous materials by thickness of drywall, color of drywall paper, color of gypsum, markings and manufacturer identification on the paper backing and end strip of the drywall.

**Sampling**  
On the first site visit when the dumpster is half full, EVS will collect three bulk samples of new construction drywall scrap. On the second site visit when the dumpster is full, EVS will collect three bulk samples to complete the sampling requirement for miscellaneous materials. These samples will be wetted during the inspection and placed into individual plastic zip bags and independently labeled. EVS will collect three of each homogeneous miscellaneous material.

- A separate side by side quality control sample will be collected after every 20<sup>th</sup> sample and delivered to a separate laboratory.
- EVS will don proper personal protective equipment such as gloves, and a respirator during the inspection.

EVS recommends sealing the dumpster at completion of sampling prior to relocating to the recycling site.

## Analysis

7830 W. Alameda Ave., #415 █ Lakewood, Colorado █ 303.800.8187 █ [www.Enviro-Spec.com](http://www.Enviro-Spec.com)



is will be delivered to an accredited laboratory under the National Accreditation Program (NVLAP) for analysis by Polarized Light (PLM) using the Environmental Protection Agency's (EPA) August 4 EPA/600/R-93/116, "Method for Determination of Asbestos in Bulk Materials."

vide a final report for each individual dumpster to include the location, photos, lab report, description of material, drawing, name of artifacts, date of inspection, and location of collected samples.

**Recommendations**  
to the requirements set forth by Regulation 8, EVS recommends a minimum of two miscellaneous samples of the finished Gyptek in the manufacturing facility as a quality control measurement and y Transmission Electron Microscopy (TEM) to determine additional this material.

iates the opportunity to provide asbestos inspection services to 5280 and look forward to our working relationship. If any questions, or concerns arise regarding this document please do not hesitate to

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# Project Summary

# Inspection

# Sampling

# Analysis

# Reporting



COLORADO  
Department of Public  
Health & Environment



Stormwater

APEN (Air Pollutant Emissions  
Notice)

Conditional Use

Water Quality

Hazardous Waste

Land Use

Permits: Site, processing, building,  
environmental

# Success Questions

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## Manufacturing

- Is the material an input?
- Is the material a stand-alone ingredient?
- Is the equipment off the shelf or new technology?

## Sales

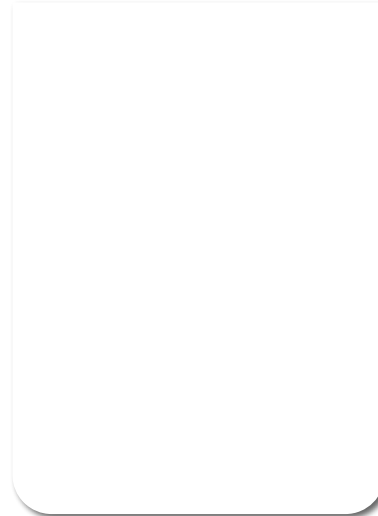
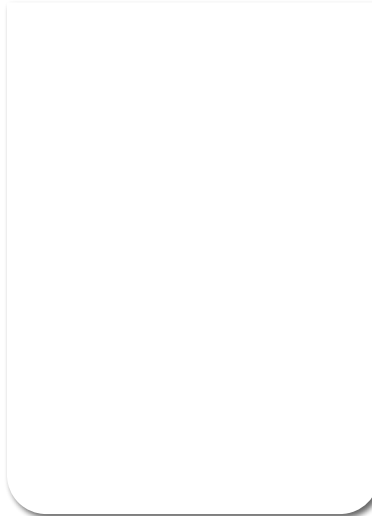
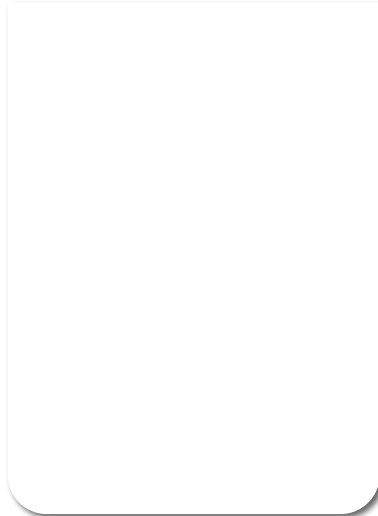
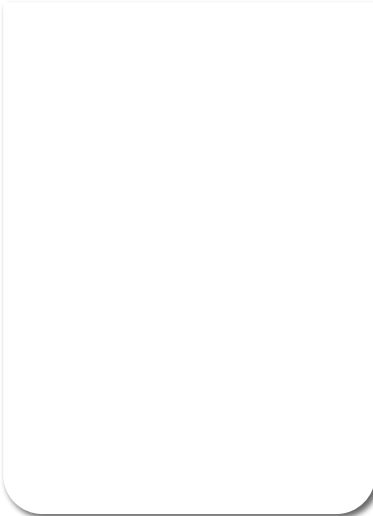
- Who is your market?
- What is the demand?
- How long is the life of the demand?

## Distribution

- Where is your market?
- What is the cost to transport?
- Is the market local, regional, national, international?

# Current end market projects: status

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# Thank you

## Contact info

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