



SPECIAL EDITION

Diverting construction and demolition waste is important!

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According to the California Integrated Waste Management Board (CIWMB) 2004 Waste Characterization Study, construction and demolition (C&D) materials in 2003 comprised nearly 22 percent of all waste disposed in California. (The study is available at www.ciwmb.ca.gov/Publications/default.asp?pubid=1097.) The amount of C&D waste going to landfills suggests that California jurisdictions can make significant progress in further reducing their disposal rates by targeting C&D materials.

Common C&D materials include lumber, drywall, metals, masonry (for example, brick and concrete), carpet, plastic, pipe, rocks, dirt, paper, cardboard, or green waste related to land development. Of these, metals are the most commonly recycled material, while lumber makes up the majority of C&D material that still goes to a landfill.

Waste generated in C&D activities also includes large quantities of material found in the general waste stream. For example, the C&D waste stream also includes corrugated cardboard from packaging, a variety of plastics (such as, PVC pipe and packaging), glass, and yard wastes from site work and clearing. Existing municipal recycling programs may be suitable for recovering these common materials. Some of the other materials, however, may need special handling, either as solid or as hazardous waste.

The CIWMB's Construction and Demolition Materials web page at www.ciwmb.ca.gov/ConDemo/Materials/default.htm has additional information on C&D materials. The Construction and Demolition Debris Recycling web page (www.ciwmb.ca.gov/ConDemo/) includes a multitude of information on C&D waste and diversion.

This special edition of *infoCycling* includes information on a C&D Forum set for May 31, 2006, asphalt shingle recycling, a recycler of the year award received by a Los Angeles company, the recycling ordinance of the City of Redlands, CIWMB C&D diversion tools for local jurisdictions, construction and demolition ordinances in California, and examples of jurisdictions' C&D diversion programs.



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C&D Forum— Closing the Loop on Construction and Demolition Materials

The California Integrated Waste Management Board is hosting a forum on construction and demolition (C&D) waste diversion as it relates to creating infrastructure, procurement, and reuse and marketability.

The forum, "Closing the Loop on Construction and Demolition Materials" will include two panels of experts discussing the following topics:

1. Local government experiences with creating and/or using infrastructure to divert C&D waste.
2. Industry and local government perspectives on issues related to creating markets for C&D

Asphalt shingle recycling

Asphalt shingles constitute one of the top ten waste types in California's self-haul waste stream. (**Note:** Self-haul waste means waste that is hauled to a transfer, processing, or disposal facility by someone other than a franchise waste hauler or by someone whose primary business is not waste hauling.)

The self-haul sector contributes to roughly 20 percent of the state's total disposal. According to the

materials, as well as an example of reusing C&D materials.

The forum will be held on Wednesday, **May 31, 2006**, at the address below.

California Environmental Protection Agency
1001 I Street
Coastal Hearing Room
(Second Floor)
Sacramento, CA 95812

The forum is scheduled to start at 9:00 a.m. and conclude no later than 1:00 p.m. The forum will also be broadcast on the web. A map and parking information is available at www.ciwmb.ca.gov/BoardInfo/Location/.

For more information on the forum, contact Janee' Thomas at (916) 341-6199. Or, visit the Construction and Demolition Forum: Closing the Loop on C&D Materials web page at www.ciwmb.ca.gov/LGCentral/Events/CandDMay06/default.htm.

2004 Waste Characterization Study (www.ciwmb.ca.gov/Publications/default.asp?pubid=1097) published by the California Integrated Waste Management Board (CIWMB), 767,981 tons of asphalt shingles were disposed in 2003, or 1.9 percent of California's overall 2003 disposal.

The Shingle Recycling.org website (www.shinglerecycling.org/) reports that about 11 million tons

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of asphalt shingles are disposed of in the U.S. each year. Approximately 1 million tons is from post-manufacturer scraps, and the remainder is removed from residential and commercial roofs.

In California, facilities that will accept asphalt shingles for recycling are limited. However, some construction and demolition recycling facilities can be found in Southern California, the Bay Area, and along the central coast that accept asphalt shingles for recycling.

One facility in the City of Shafter in Kern County recycles post-manufacturer scraps from a local asphalt shingle manufacturing plant.

A limiting factor for facilities that recycle asphalt shingles is a lack of viable markets for this material. For example, one large C&D processing facility located in the City of Santa Barbara reported they currently are not able to accept asphalt shingles for recycling because they cannot find any viable market within Santa Barbara County.

Currently, the most common use for this waste material in California is on unimproved and temporary roads or parking lots. For example, the Monterey Regional Waste Management District, which covers the coastal area of Monterey County, collects source-separated loads of asphalt shingles and uses them as road base for unimproved roads and temporary roads at a local landfill.

Examples of available methods for diverting asphalt shingles can be found in New Hampshire and Minnesota:

- The City of Keene in New Hampshire accepts asphalt shingles at the city's recycling facility and transports the material to a cold patch road repair facility in Scarborough, Maine, where it will be recycled. Additional information is available at www.ci.keene.nh.us/publicworks/recycle/asphalt-shingle-spec.html.
- In 1991, the Minnesota Department of Transportation (Mn/DOT) began investigating whether shingle by-product from the manufacturing process—such as the cuttings from shingles composed of paper or fiberglass mat, an asphalt binder, and ceramic aggregate—could prove a usable and beneficial additive to hot-mix asphalt for paving.

Through its research and field testing, Mn/DOT confirmed that asphalt pavement mix containing shingle by-product performed at least as well as or better than those mixes without shingle by-product.

As a result, in 1995 Mn/DOT formally issued specifications for the use of up to 5 percent (by weight of mixture) shingle by-product in all courses for both Type 32 and Type 42 mixtures. The Minnesota

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specification currently limits the use of recovered asphalt shingles to by-product from the manufacturing process only; used roofing shingles, also known as tear-off shingles, are not yet allowed. Additional information on this topic is available at www.moea.state.mn.us/lc/purchasing/shingles.cfm.

Many other states, including Georgia, Indiana, Maryland, Michigan, New Jersey, North Carolina, and Ohio allow asphalt shingles to be recycled into the pavement of their state roads. Generally the specifications allow up to 5 percent of asphalt shingles to be incorporated into their asphalt pavement. (See the

Asphalt Roofing Shingles in Asphalt Pavement web page at www.ciwmb.ca.gov/condemo/Shingles/Pavement.htm.) Some states also allow recovered asphalt shingles to be mixed into cold patch for road repairs.

A large amount of asphalt shingles are disposed of each year in California. State agencies, industry, and local governments must work together to develop the infrastructure and markets needed to find a sustainable alternative to landfilling asphalt shingles.

The Asphalt Roofing Shingles Recycling: Introduction web page (www.ciwmb.ca.gov/condemo/Shingles/) contains additional information related to asphalt roofing shingles.

Los Angeles—Construction and demolition diversion

Did you know that a Los Angeles company was recognized as the top mixed construction and demolition (C&D) debris recycling facility in the nation? Take a look at the article "C&D Recycler of the

Year Recognized" in the *American Recycler's* March 2006 issue. The article is available at <http://www.americanrecycler.com/0306cd.shtml>.

A Closing the Loop on C&D Materials forum will be held May 31, 2006. See page 2 for details.

City of Redlands— Development of a construction and demolition debris recycling ordinance

Many cities find construction and demolition (C&D) debris to be a significant portion of their waste stream. Many of these same cities adopted a C&D diversion ordinance to help divert C&D waste from landfills. One example, the City of Redlands, adopted a C&D diversion ordinance in June 2003.

The City of Redlands ordinance requires planning for recycling C&D debris at the beginning of a project. Specific components of the ordinance include:

Recycling of Construction Debris—Conditions of development include requirements for deconstruction and/or the recycling of C&D debris. Demolition permits and building permits are not issued until a recycling plan for C&D debris is submitted by the applicant and approved by the city.

Recycling as a Condition of Post-Occupancy—The ordinance is set up so that recycling continues after the completion of the project. Conditions of development include requirements for tenants and owners of single-

family residences and multifamily complexes, as well as owners and employees of businesses, to subscribe to recycling services post-occupancy. Building permits are not issued until a recycling plan for post-occupancy is submitted and approved by the city. Elements of the recycling plan include information on:

- Identifying material targeted for recycling.
- Recycling targeted materials.
- Recycling container requirements for deskside and work areas.
- Identifying signage to promote recycling.
- Recycling education for employees and tenants.
- Promoting a recycling program.

Staff and Technical Assistance—The City of Redlands provides model C&D recycling plans to developers upon request. Model plans are provided in electronic format to help developers facilitate completion of the recycling section of the development application. Free compact discs are displayed on public counters.

In addition, the city provides free consultation to architects to optimize design for recycling. The city often meets with contractors and developers to develop plans together. Implementation of the ordinance is designed to be regulatory-friendly and to facilitate compliance during the permit process.

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More information on the City of Redlands C&D ordinance

To date, a total of 240 building permits have been tied to approved recycling plans for the recycling of C&D debris and post-occupancy recycling conditions.

These building permits range from simple commercial tenant improvements and the construction of single family residences to large warehouse and tract developments. The ordinance

requires developers to submit documentation of recycled materials as a condition for issuance of the Certificate of Occupancy. Most importantly, every development will be required to have recycling service post-occupancy.

Contact information

If you have additional questions on the City of Redlands C&D ordinance, contact Gary Van Dorst, Solid Waste Manager, City of Redlands Solid Waste Division, at (909) 798-7583.

Construction and demolition ordinances in California

Many jurisdictions find that an effective solution for diverting construction and demolition material is to adopt and enforce a mandatory C&D recycling ordinance. Approximately 142 jurisdictions have adopted a C&D diversion ordinance to date.

Local governments have adopted C&D ordinances that are as varied as the individual jurisdictions themselves. Links to some of these ordinances are available on the CIWMB's Local Government Sample Documents web page at www.ciwmb.ca.gov/ConDemo/SampleDocs/Default.htm.

To assist jurisdictions in the process of developing and adopting C&D ordinances, the CIWMB has developed a Model C&D Diversion Ordinance and a C&D Diversion Informational Guide. The model ordinance and the guide are available on the

CIWMB Construction and Demolition Diversion Informational Guide web page at www.ciwmb.ca.gov/LGLibrary/CandDModel/Default.htm.

The Model C&D Diversion Ordinance is a user-friendly model developed to provide maximum flexibility to prospective users. Jurisdictions are encouraged to modify the model ordinance to accommodate their specific needs.

For example, a jurisdiction can include its own definitions, cost and/or square footage thresholds, and deposit amounts that best reflect its C&D waste stream.

The model ordinance contains the following sections:

- Definitions.
- Thresholds.

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C&D ordinances in California, continued from page 6

- Diversion requirements.
- Waste management plans.
- Deposits.
- Reporting.
- Penalties.

The C&D Diversion Informational Guide is a companion tool to the model ordinance, with corresponding information for each section of the model ordinance. The guide provides information collected from other jurisdictions that currently have C&D diversion ordinances in place. The guide also discusses some methods a jurisdiction can use to encourage the diversion of C&D waste from landfills.

Considerations when developing a C&D ordinance

When developing a C&D ordinance, jurisdictions should consider available resources. For

example, some C&D recovery facilities available in certain areas are limited to accepting only source-separated materials.

When mixed C&D processing facilities are not available, jurisdictions will need to take into account what kinds of projects are capable of source-separating their C&D waste. Taking available resources into account will help jurisdictions identify the thresholds and project types that should be covered by the ordinance.

In addition to enacting a C&D ordinance, jurisdictions may want to take steps to site new facilities that are capable of recycling a wider variety of materials or that accept mixed loads of C&D debris.

The following article, "Examples of construction and demolition diversion programs," provides examples of how some jurisdictions have dealt with recovering and recycling C&D debris.

Examples of construction and demolition diversion programs

Many jurisdictions in California have taken steps to increase their diversion of construction and demolition waste by:

- Implementing requirements.
- Implementing incentives.
- Creating viable alternatives to disposing C&D waste.
- Encouraging establishment of a C&D recycling facility.

Many jurisdictions now have C&D programs linked to requirements of building permit applicants (permit applicants).

Examples of some jurisdictions' C&D diversion programs are highlighted on pages 8-11.

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Examples of C&D diversion programs, continued from page 7

San Diego County

San Diego County recognized the need for facilities to sort and recycle mixed loads of C&D waste. The county issued a request for proposal (RFP) for a \$400,000 technical assistance grant for industry to use matching funds to build a facility in the county.

San Diego County went through the public process to site its new facility. (**Note:** A facility is currently under construction and should become active sometime later this year.)

In order to ensure the success of the new facility, the county is working to develop and pass a C&D ordinance. The county worked with neighboring jurisdictions to ensure that ordinances and reporting forms were similar countywide.

Since the county's building department generally receives and reviews all building-related plans, building staff and recycling staff are working together to ensure the plans are properly completed and reviewed in a timely manner. Recycling staff will review the plans and be available to answer any questions that permit applicants may have.

City of San Diego

The City of San Diego in San Diego County saw the need to divert C&D waste after conducting a waste characterization study. The study, completed in 2000, showed that C&D waste made up 35 percent of the waste entering the city-operated landfill. The city took

a two-step approach to this problem.

First, the city released an RFP for a mixed C&D recycling facility to be constructed on the city's landfill site. The city offered \$500,000 to prepare the site, free land to construct the site, free electricity to operate the site, and free use of the composting facility already on-site.

The city also offered to collect all of the fees as C&D haulers enter the site. The facility operator is responsible for designing, building, and operating the mixed C&D facility.

Second, the city adopted a C&D diversion ordinance in October 2005 to ensure that contractors, haulers, and residents use the facility to divert their C&D waste.

The city was concerned that recycling facilities often have a difficult time competing with low tipping fees at disposal facilities. In addition, some waste facility operators around the state have expressed a reluctance to invest in siting large C&D recycling facilities unless they are ensured that contractors, haulers, and residents will use the facility once it is constructed. A C&D ordinance can ensure the continued success of the C&D recycling facility.

The city's ordinance will become effective 45 days after the facility is fully operational. (The facility is still being planned.)

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Examples of C&D diversion programs, continued from page 8

City of Antioch

The City of Antioch in Contra Costa County considered C&D waste a high enough priority to review WMPs. The city also wanted to ensure that the C&D waste is recycled.

Antioch developed its WMP to be simple, enabling permit applicants to spend the least amount of time to complete the plans. The city also wanted staff review of the plans to be as simple as possible. The city's WMP form requires permit applicants to identify C&D waste (also known as materials) that can be diverted.

The form also requires applicants to identify facilities where the C&D waste will be transported for diversion. The application can be viewed on the city's website at www.ci.antioch.ca.us/Environment/CDROrdinance.htm.

At the project's conclusion, permit applicants must identify where the C&D waste was taken and the weight of the C&D waste taken to those facilities. Permit applicants must also submit receipts to verify the amount of C&D waste recycled.

The C&D recycling facility has a standard recovery rate that builders get credit for if they bring their C&D waste to that facility. Or, the facility lists the estimated diversion rate on the receipt from a visual inspection of the load that was delivered to them.

Since the City of Antioch adopted their C&D ordinance in April 2004, seven violations of the city's C&D

ordinance had to be enforced.

These violations are due to permit applicants not keeping or submitting the proper receipts with the final report. Because the city is more concerned with assuring C&D waste is diverted than with collecting fines from violators, the city has only fined small projects \$100 for their first violation.

The city believes these fines are sufficient enough to send a message that they are serious about the C&D ordinance, but not too overwhelming for small contractors to pay.

Antioch and other jurisdictions in Contra Costa County have worked on a regional basis to identify C&D recycling facilities within the county. The facilities are listed on a C&D recycling guide provided to contractors and residents that apply for a building or demolition permit.

Occasionally C&D waste is delivered to C&D recycling facilities outside of Contra Costa County. Jurisdictions may contact the facility to verify the diversion activity and diversion rate.

City of Laguna Niguel

The City of Laguna Niguel in Orange County took a different approach to simplifying the C&D debris diversion requirements for permit applicants. The city's C&D ordinance gives permit applicants two options to satisfy their diversion requirements.

It takes teamwork to reduce C&D waste and meet or exceed diversion goals.

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Examples of C&D diversion programs, continued from page 9

The first option is permit applicants may self-haul their C&D waste to appropriate diversion facilities. Permit applicants who choose to self-haul their own C&D waste must complete and submit a WMP along with a security deposit.

In order for permit applicants to get their deposit refunded, they must submit a final report along with appropriate documentation showing they have diverted at least 50 percent of the C&D waste generated by the project.

The second option is for permit applicants to use the city's franchise hauler for all of their C&D waste project needs. Permit applicants must still submit a security deposit to ensure compliance. However, permit applicants do not need to submit a WMP because submitting hauler receipts are sufficient documentation. The receipts show that the permit applicants used the city's franchise hauler.

By using the franchise hauler, the permit applicants have automatically met the diversion goal and are eligible for a refund of their security deposit. Nearly all of the city's permit applicants have chosen to use the city's franchise hauler. This has greatly reduced the amount of time the city needs to review plans. This option also provides the city's hauler with a steady stream of C&D waste.

When the city first passed its C&D ordinance in October 2003, neither the hauler nor the city expected a large amount of C&D diversion from the program. The city felt

there was not much room for growth within the city, so there would not be much opportunity to divert C&D waste. The hauler started hand-sorting C&D waste at the landfill but soon realized the volumes were too great for that method.

The hauler then started taking the C&D waste to a C&D sort line at a materials recovery facility (MRF) that sorted and recycled all loads of C&D waste. The program became so effective that the hauler now takes all loads identified as C&D-rich loads to a local C&D MRF, even if the load was not generated from a project that fell under the city's C&D ordinance.

The city expects that C&D diversion will continue to increase because the city is entering a phase of increased demolition and renovation projects that should last for several more years.

Calaveras County

Calaveras County took a unique approach—from other jurisdictions—to diverting C&D waste in their county.

The county passed an ordinance in February 2003 that bans all C&D waste from the county's transfer stations. The only legal option available in the county is for contractors and haulers to take C&D waste to a privately-owned recycling facility in the county or to the county's recycling facility in Rock Creek.

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Examples of C&D diversion programs, continued from page 10

The Rock Creek facility takes source-separated loads for free to encourage contractors to separate loads as much as possible.

The program has proved very successful for the county. Calaveras County has increased their C&D waste diversion significantly.

Where can I obtain additional information?

The California Integrated Waste Management Board is continuing to develop tools and other

resources to assist jurisdictions that are targeting C&D waste for diversion.

If your jurisdiction is interested in establishing a new C&D waste diversion program, expanding an existing C&D waste diversion program, or adopting an effective C&D diversion ordinance, please contact your Office of Local Assistance (OLA) representative for assistance. A list of OLA representatives is available at www.ciwmb.ca.gov/OLA/Contacts.asp.

Contact information

If you would like additional information on C&D waste and its diversion, contact your CIWMB Office of Local Assistance (OLA) representative. A list of OLA

representatives is available on the Local Assistance Contacts web page at www.ciwmb.ca.gov/OLA/Contacts.asp.

Editor's note

I hope you found this edition of *infoCycling* informative and interesting. Look for an article on conversion technologies in the summer 2006 Edition of *infoCycling*.

Please contact me with suggestions on articles you would like to see included in *infoCycling* and announcements of events in your jurisdiction or at your State agency. You can reach me at (916) 341-6240 or at twebb@ciwmb.ca.gov.