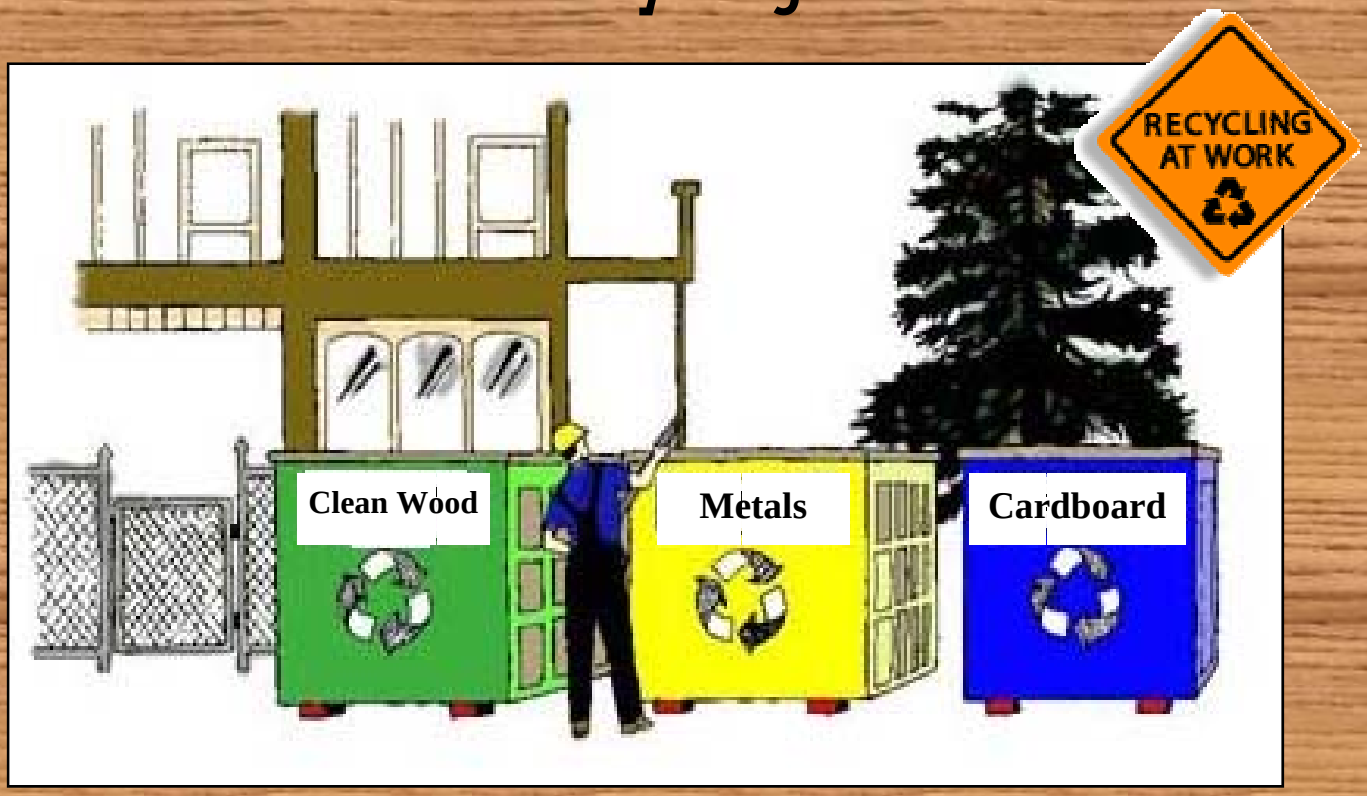
Construction Site RECYCLING

A Guide for Building Contractors

to comply with the City of Woodland's C&D Debris Recycling Ordinance



Save Money and Resources Through Job-Site Recycling and Waste Prevention

City of Woodland
Environmental Operations

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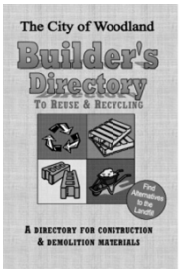
This Guide Has Been Developed To Help Woodland Builders, Contractors, And Residents To Stay In Compliance With The City's C&D Debris Recycling Ordinance By Reusing And Recycling Construction And Demolition Materials.

Builder's Directory

For More Information on C&D Recycling and Reuse Facilities

The City of Woodland Builder's Directory, a companion to this Construction Site Recycling Guide, includes information on:

- Facility locations along with acceptable materials
- Setting Up a Job-site Recycling Program
- Conversion numbers for particular materials
- Properly disposing of Hazardous Waste (HW) and Electronic Waste (E-Waste)
- Material Exchange programs



To receive this free guide, call:
City of Woodland Environmental Operations at 530-406-5113.
This guide is also available on-line at www.cityofwoodland.org

TABLE OF CONTENTS

Introduction/Need Help? 1
Commonly Asked Questions about C&D....2
Waste Prevention....3
Understanding C&D Recycling Requirements 4
C&D Debris Recycling Packet....5
3 Steps to Compliance....5
Waste Reduction & Recycling Plan....6
Waste Reduction & Recycling Quarterly & End of Project Reports 7
Setting Up a Job-Site Recycling Program 8-10
Self-Haul Vs. Commercial Hauler....11
Troubleshooting Your Program 12
Salvage & Reuse of Building Materials....13
Using Recycled-Content Building Materials 14

APPENDICES

Appendix A: Waste Management At-a-Glance....15
Appendix B: Sample Materials....16
Sample Waste Reduction & Recycling Plan....16
Sample Waste Reduction & Recycling Report....17
Sample Receipts....18
Appendix C: Worksheets....19
Commercial Recycling Economics....19
Self-Haul Recycling Economics....20
Appendix D: Conversion Factors....21
Appendix E: Where to Get More Information....22

INTRODUCTION

This guide provides recycling, waste prevention, and ordinance compliance information for all builders. It is your handbook for compliance as well as saving money and resources by recycling and preventing waste on the job.

In 1989, the State of California mandated that all cities reduce landfilled waste by 50% in the year 2000 and beyond. Despite increased recycling throughout California, landfilled waste continues to grow, largely due to increased construction activities.

Construction and demolition (C&D) materials occupy up to 11% of the waste stream. To encourage C&D recycling, the City of Woodland has implemented a C&D debris recycling ordinance. This ordinance requires contractors and builders to recycle 50% of their debris from the landfill. A copy of the ordinance can be found in your C&D Debris Recycling Packet at the Community Development Department or on-line at www.cityofwoodland.org

Common C&D materials include lumber, drywall, metals, brick, concrete, carpet, plastic, pipe, rocks, dirt, cardboard, or green waste. Many of these materials can be reused or recycled, thus prolonging our supply of natural resources and potentially saving money in the process.

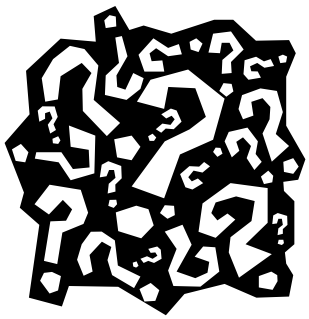
This guide contains valuable information on recycling C&D debris that could assist you with City ordinance compliance, reduce the disposal of valuable resources and save you money!

NEED HELP?

Call the City of Woodland Environmental Operations at (530) 406-5113. You may also find answers to commonly asked questions on City of Woodland's website at: www.cityofwoodland.org

The City of Woodland provides a wide range of free information on Recycling C&D Debris including a C&D Debris Recycling Packet, a C&D Recyclers Directory plus instructions to developing job-site Waste & Recycling Management Programs.

Commonly Asked Questions about C&D



WHAT DOES C&D STAND FOR?
Construction and Demolition

WHY IS IT IMPORTANT THAT CONSTRUCTION DEBRIS BE RECYCLED?
Multiple natural resources can be saved by recycling C&D waste, which makes up 11% of trash going into the Yolo County Central Landfill. Also, many cities, such as Woodland, are required by the state to have a C&D ordinance.

WHO CAN I HIRE TO RECYCLE C&D DEBRIS?
The City's *Builders Directory to Reuse and Recycling* identifies a variety of businesses that recycle C&D debris. While you may self-haul recycling or solid waste, Waste Management is the only company that may collect or transport solid waste from your construction or demolition site.

WHY AM I ASKED WHAT CITY MY WASTE ORIGINATED?
The State requires each City and County to reduce waste through recycling, composting or other diversion activities. To gather statistics by City, landfill and transfer station gatekeepers ask where the waste originated.

HOW DO I MAKE SURE MY RECEIPTS REFLECT RECYCLING?
First, you must make sure that you are taking your load to a facility that can recycle the materials you have. When you are at the gate of any facility, be sure to tell them that you would like to recycle the material and you need a receipt that reflects that.

WHAT DO I DO ABOUT THE WASTE GENERATED BY MY SUBCONTRACTORS?
The general contractor is responsible for ensuring that the recycling requirements are met for all waste generated on site, including waste generated by the subcontractors. One way to handle this is to withhold payment to the subcontractors until receiving receipts from them.

CO-MINGLED VS. SOURCE SEPARATED, WHICH IS BEST FOR YOUR PROJECT?

Definitions:
Co-mingled recycling service allows contractors to put select recyclables such as wood, cardboard, and metals in one container. The recycling company takes the materials to a sorting facility where the materials are separated for recycling.

Source Separated recycling service involves collecting recyclables in separate containers as they are generated. The recycling hauler takes the materials directly to a recycler or a transfer site.

Pros & Cons:
The recycling rate on co-mingled programs can be significantly lower than source separated programs. In co-mingled programs, many recyclables, such as drywall and carpet, are disposed of as garbage. These materials must be source-separated for recycling. It is also challenging to quantify the amount of materials recycled on a particular project. Co-mingled recycling is cheaper than garbage disposal but source-separated recycling saves more money.

On job-sites where space is premium, however, having fewer recycling containers on-site and co-mingling the recyclables saves valuable space and labor. (Check out *Troubleshooting Your Program* on page 12 for source separating tight sites.)

SOURCE SEPARATED RECYCLING METHOD PROVIDES THE MOST ACCURATE DOCUMENTATION.

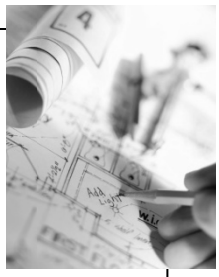
Making Co-mingled Recycling Work:
Co-mingled recycling is particularly suited for residential demolition. Even when using co-mingled recycling services, set up separated recycling for recyclables not accepted in your program, such as carpet, ceiling tiles, drywall, film plastic and concrete. Source separated recycling method provides the most accurate documentation. If source separation is not possible, use only facilities with a high co-mingled recycling rate.

Waste Prevention

Waste prevention is more beneficial than recycling. Why? Activities that prevent the production of waste, such as reusing materials on-site and reducing packaging, minimize material use and expenses. Small changes to building practices can add up to significant savings for the builder and the environment.

Follow the 5 steps to preventing waste

1 Design to Prevent Waste



Identifying potential waste early in the design process decreases waste generated during construction. Suggest the following ideas to the architect or designer.

- Design with standard sizes for all building materials.
- Specify materials and assemblies that can be easily disassembled at the end of their useful life.
- Choose durable interior finishes or materials such as carpet tiles that can easily be removed and recycled when worn.
- Design spaces to be flexible for changing uses.
- Consider reusing materials (on-site) or installing salvaged materials from off-site sources.

2 Plan for Waste Prevention

Plan ahead and incorporate the following into standard construction practices for maximum waste prevention.

- Set waste prevention goals and target specific waste producing practices.
- Communicate your waste prevention plan at meetings and post it on-site.

3 Construction Methods that Prevent Waste

Many construction methods are less wasteful because they use materials more efficiently. For example:

- For wood construction, use advanced framing techniques, trusses for roof and floor framing, finger-jointed studs and trim, and engineered wood products.
- Consider using wood frame wall panels prefabricated off-site.
- For concrete construction, use pre-cast concrete members.

4 Prevent Waste Through Job-site Practices

Many on-site practices can make a difference in the amount of waste produced, such as:

- Set up central cutting areas for wood and other materials. Make sure the crew uses all the reusable pieces before cutting a new piece.
- Reuse concrete forms on the job and on other job-sites. Wood forms can frequently be used up to 15 times. Alternatively, use reusable metal or fiberglass forms.
- Clearly mark areas key to waste prevention, such as the material storage, central cutting, and recycling stations.
- Practice material storage and handling procedures that prevent loss from weather and other damage.
- Clean and maintain equipment properly to get the full life out of it.

5 Purchase to Prevent Waste

Purchasing decisions have a major impact on the amount of waste generated on a project.

- Purchase reused, recycled, or recycled-content materials and equipment whenever possible.
- Replace toxic materials with less toxic or non-toxic products to reduce hazardous packaging
- Maintain an up-to-date material ordering and delivery schedule to minimize the amount of time that materials are on-site and reduce the chance of damage.
- Choose products with minimal or no packaging.

Understanding C&D Recycling Requirements

The City of Woodland has adopted a C&D Debris Recycling Ordinance requiring contractors to divert at least 50% of their construction waste materials from the landfill. Building and demolition permit applicants are required to fill out a standard **Waste Reduction and Recycling Plan** outlining the types of waste to be generated, reused, recycled and disposed along with any subcontractors or recycling facilities involved. Applicants are also required to submit a **Quarterly and End of Project Report** outlining the amounts of waste that was generated, reused, recycled and disposed. Proof that materials have been reused or recycled must be submitted as well in the form of receipts and/or weight tickets.

Find out the City's recycling requirements and hauling restrictions prior to starting construction or demolition work.

Are you required to participate?

Yes, participation is mandatory for (1) all construction projects located in the Spring Lake Planning Area, (2) demolition projects equal to or greater than one thousand (1,000) square feet, (3) construction of a new commercial, industrial, or institutional building or structure that is equal to or greater than one thousand square feet (1,000), (4) construction of new residential dwellings in a subdivision where a homebuilder has a construction phase that includes multiple residential lots (three or more) under construction at a given time, (5) construction of new multifamily dwellings where four or more units are under construction at a given time, and (6) addition or alteration of a commercial, industrial, institutional, or multifamily building or structure that is equal to or greater than one thousand (1,000) square feet.

Is there an Administrative Fee?

Yes, all applicants must pay a non-refundable administrative fee in the amount of two hundred and seventy-five dollars ($275) for <u>each</u> building and demolition permit. The fee must be paid with the Waste Reduction and Recycling Plan, which is submitted prior to receiving your building or demolition permit.

Will I need to pay a deposit?

Yes, for applicants that do not have any other current Waste Reduction and Recycling Plans with the City, a one thousand dollar ($1,000) deposit must be submitted before the Permit is issued. For applicants that have current Waste Reduction and Recycling Plans with the City, the deposit amount will be based on the applicant's level of diversion for their existing Waste Reduction and Recycling Plans. A one thousand dollar ($1,000) deposit will be required if the applicant is achieving the fifty percent (50%) diversion requirement for their existing Waste Reduction and Recycling Plans based on quarterly diversion reports. For applicants that have three current Waste Reduction and Recycling Plans submitted to the City and that are achieving the fifty percent (50 %) diversion requirement for all projects, no additional deposit will need to be provided to the City for subsequent Waste Reduction and Recycling Plans as along as the applicant stays in compliance with their existing plans. A deposit of three percent (3%) of the total project value, not to exceed ten thousand dollars ($10,000), will be required if the applicant is not achieving the fifty percent (50%) diversion for their existing Waste Reduction and Recycling Plans based on quarterly diversion reports or if the applicant has not submitted the required reports.

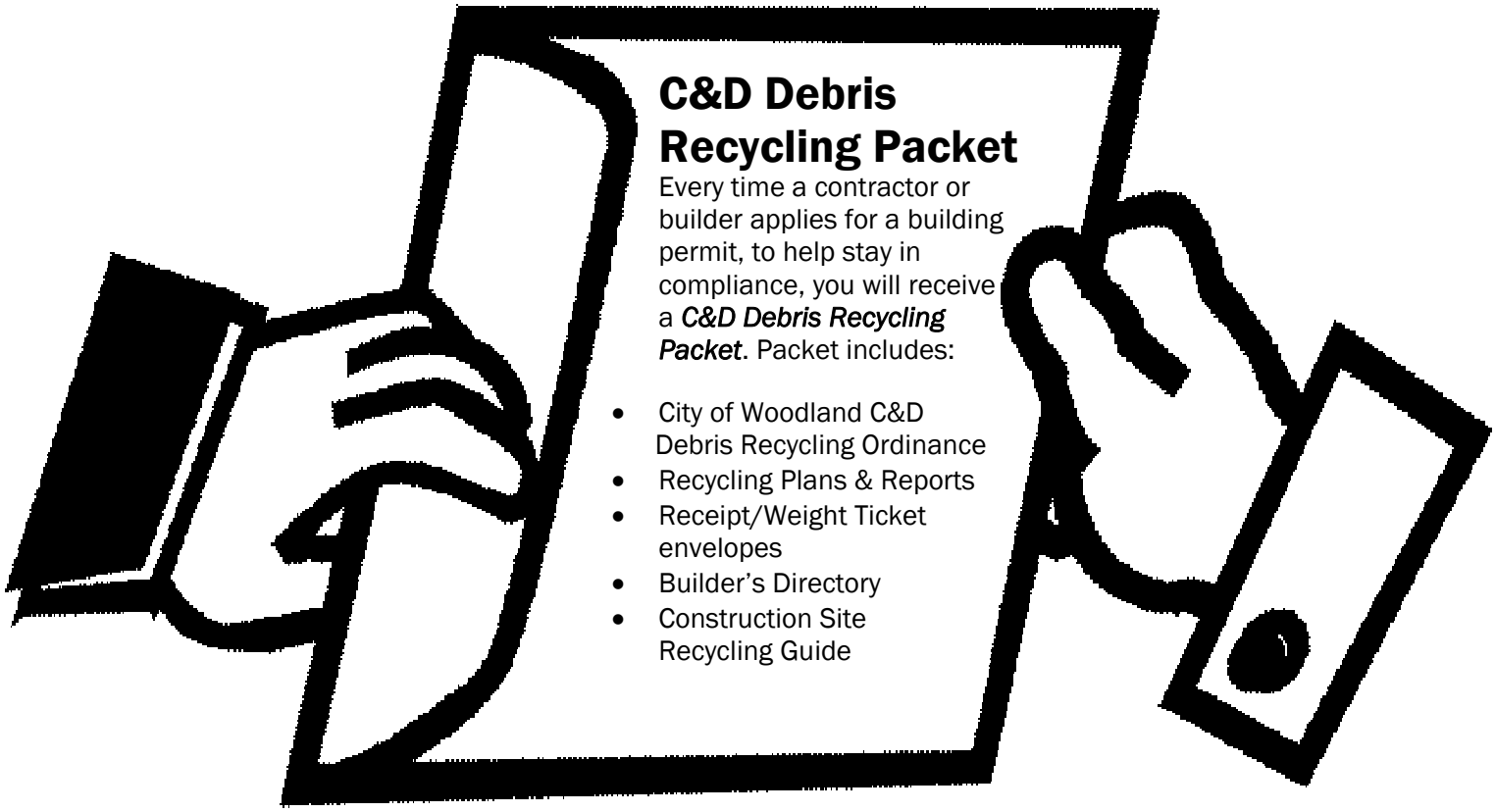
What if you will also be using sub-contractors?

Inform your sub-contractors about your recycling requirements. **You are responsible for any materials they take away** from the job-site. In order for you to comply with recycling requirements, your sub-contractors must take materials to a recognized recycling facility and provide you with recycling receipts. Remember, that's your recycling credit driving away in their truck!

What are the consequences for non-compliance?

If an applicant fails to adhere to the C&D debris recycling ordinance, the applicant could be issued an administrative fine, could be issued a stop-work order during construction or demolition, and would need to provide a larger deposit for subsequent projects within the City of Woodland.

3 Steps to Compliance



C&D Debris Recycling Packet

Every time a contractor or builder applies for a building permit, to help stay in compliance, you will receive a ***C&D Debris Recycling Packet***. Packet includes:

- City of Woodland C&D Debris Recycling Ordinance
- Recycling Plans & Reports
- Receipt/Weight Ticket envelopes
- Builder's Directory
- Construction Site Recycling Guide

3 Steps to Compliance

Depending on location, type and size of project, all contractors and developers, when applying for a building permit, must comply with the City of Woodland C&D Debris Recycling Ordinance. If applicable you <u>must</u> follow these <u>3 Steps</u> to stay in compliance and avoid unnecessary fines and delays:

1

Before receiving your building permit you must complete and submit the following:

- **Waste Reduction & Recycling Plan (WRRP)**
- **Administrative Fee** ($275 for <u>each</u> building/demolition permit)
- **Deposit**

2

During construction you must:

- **Collect receipts/weight tickets** for each material from vendors or facilities used. The receipts/weight tickets must be clearly labeled with the project title and date.
- **Submit Waste Reduction & Recycling Reports (WRRR)** on the last day of January, April, July and October.

3

Before final inspection, you must complete and submit an **End of the Project Waste Reduction & Recycling Report (WRRR).**

STEP 1: Waste Reduction & Recycling Plan (WRRP)

The City has a standard **Waste Reduction and Recycling Plan (WRRP)** form for each applicant to fill out. (*You can find a sample of the WRRP in Appendix B.*) WRRP forms can be found in the C&D Debris Recycling Packet at the City's Community Development Department and on-line at www.cityofwoodland.org. When applying for a building or demolition permit, an applicant or contractor must develop a plan to meet the diversion goals for the project. The WRRP may cover multiple building permits that are pulled all at once for lots where construction activity is occurring at the same time by the same applicant. The WRRP is part of your building permit application. This plan, along with an administrative fee and deposit, must be submitted and approved before the issuance of a building or demolition permit. The plan includes:

- ☑ Contractor and project identification information
- ☑ Procedures to be used
- ☑ Materials to be re-used and recycled, and materials disposed
- ☑ Names and locations of re-use and recycling facilities

Why?

Compliance with the City's ordinance is imperative for the City to meet the State Law that mandates every city and county recycle 50 percent of its waste materials. Failure to achieve the mandate may result in fines of up to $10,000 a day to the City of Woodland.

Avoid Delays

Submit your completed WRRP with your permit application. Remember that your building permit application is deemed incomplete without an approved WRRP. **Building permits will not be issued prior to WRRP approval.**

Building permits will not be issued without an approved WRRP.

Assistance

To help find a recycling facility for particular materials refer to the *Builder's Directory to Reuse and Recycling.* This guide includes a list of companies that haul and accept co-mingled and separated C&D debris for recycling. Staff is available to help you plan your recycling program, identify facilities that will accept your C&D debris for recycling and answer questions about filling out forms. For assistance, call (530) 406-5113.

STEP 1: Administrative Fee

All applicants must pay a non-refundable administrative fee in the amount of two hundred and seventy-five dollars ($275) for each building and demolition permit. The fee must be paid with the Waste Reduction and Recycling Plan, which is submitted prior to receiving your building or demolition permit. The fee is to compensate the City for all administration duties such as reviewing and inspecting the project, determining approval of the WRRP and WRRR and determining compliance.

STEP 1: Deposit

- All applicants that do not have any other current Waste Reduction and Recycling Plans with the City, a one thousand dollar **($1,000) deposit** must be submitted with the Waste Reduction and Recycling Plan.
- For applicants that have current Waste Reduction and Recycling Plans with the City, the deposit amount will be based on the applicant's level of diversion for their existing Waste Reduction and Recycling Plans.

Level of Diversion (existing WRRP)	Future Deposit Amount
50%	$1,000
3 current projects with 50%	$0
Less than 50%	3% of total project value (not to exceed $10,000)

STEPS 2 & 3: Waste Reduction & Recycling Reports (WRRR)

STEP 2: Quarterly Waste Reduction & Recycling Report (WRRR)

Once your Building Permit is issued and construction begins, applicants must submit proof of compliance with the ordinance by submitting a **Quarterly Waste Reduction & Recycling Report (WRRR).** Unlike the WRRP, which indicates how materials will be handled, the Quarterly WRRR documents your actual tonnages. The Quarterly Reports are due every January 31, April 30, July 31, and October 31 and are to cover the previous three calendar months. The City has a standard Waste Reduction and Recycling Report (WRRR) form for each applicant to fill out. (*You can find a sample of the WRRR in Appendix B.*) WRRR forms can be found at the City's Community Development Department and on-line at www.cityofwoodland.org. Proof of compliance includes the submittal and approval of the following:

- ☑ Completed Waste Reduction & Recycling Report
- ☑ Receipts or weight tickets
- ☑ Any additional information needed to support a good faith effort

Receipts & Weight Tickets

After your Building Permit is issued and you are ready to begin work, you will need to begin recording information for your Waste Reduction & Recycling Reports (WRRR). You are required to keep all receipts and weight tickets necessary to document actual quantities of materials generated, reused, recycled, and/or disposed of throughout the project, as well as facilities or service providers used. Receipts from vendors or facilities which collected or received each material must show actual weight or volume of that material. The receipts need to be clearly labeled with the project title and date. The City provides receipt/weight ticket envelopes for easy handling. These envelopes are included in your C&D Debris Recycling Packet and can be picked up at the Community Development Department.

STEP 3: End of Project Waste Reduction & Recycling Report (WRRR)

A completed **End of Project Waste Reduction & Recycling Report (WRRR)** must be submitted to the City prior to sign off at Final Inspection or Certificate of Occupancy. The End of Project WRRR is similar to the Quarterly WRRR, except that you are reporting for a shorter period of time. Just like the Quarterly WRRR you are required to verify material quantities with receipts or weight tickets.

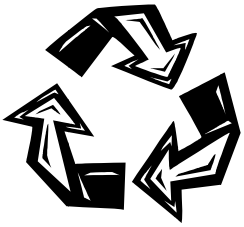
Subcontractor Participation

It is your responsibility to obtain written receipts from subcontractors and other parties removing debris from your site. Notify subcontractors/haulers of this requirement before work begins. More information on subcontractor participation can be found in the *Troubleshooting Your Program* on page 12.

Consequences for Non-Compliance

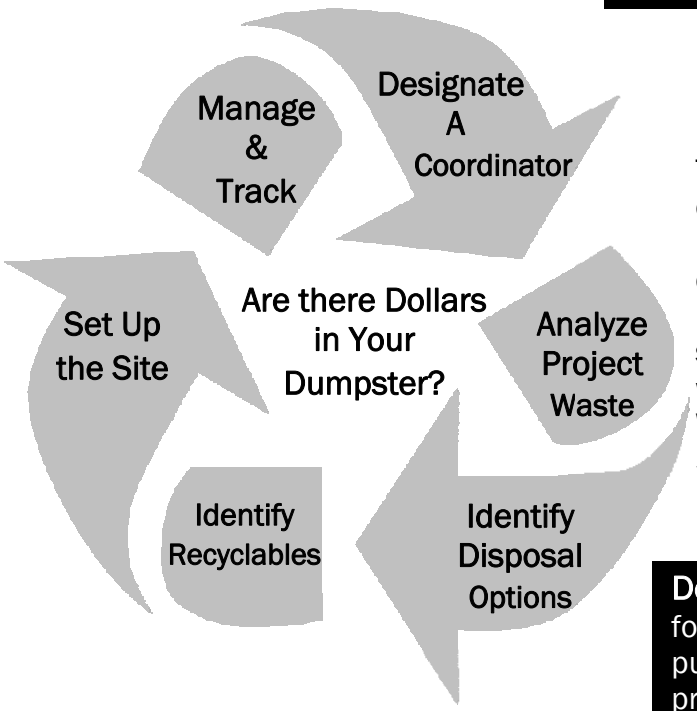
If an applicant fails to adhere to the C&D Debris Recycling Ordinance, the applicant could be issued an administrative fine, could be issued a stop-work order during construction or demolition, and would need to provide a larger, deposit for subsequent projects within the City of Woodland.

Setting Up a Job-Site Recycling Program



Rising landfill fees have made disposal of C&D debris a significant expense. **Recycling** construction materials saves money by cutting disposal costs. It reduces waste going to the landfill and attracts clients who value environmental responsibility. Other benefits include a cleaner, safer site. Follow these steps to set up a successful, cost-effective job-site recycling program.

Start Early Incorporate recycling early on to guarantee success.

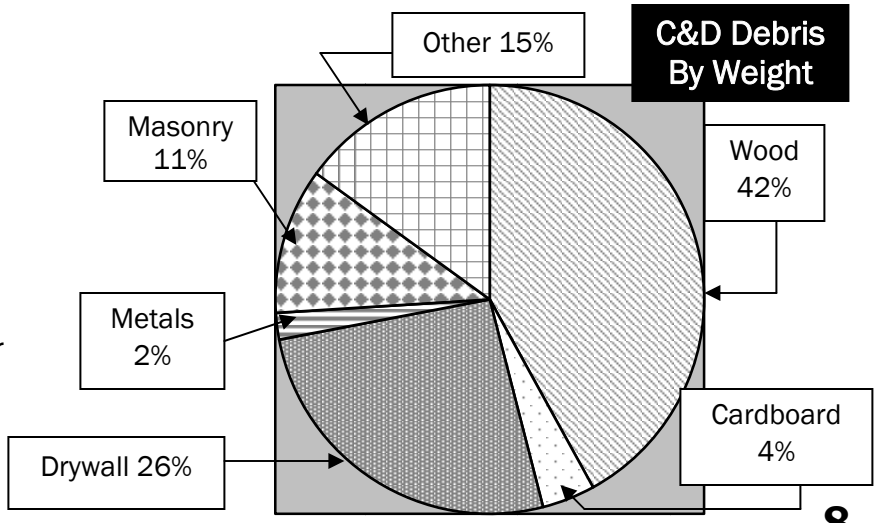


Design a Job-Site Recycling Program A program identifies materials to be recycled on a project, including materials subcontractors will be responsible for recycling. The program outlines costs, recycling procedures, expectations, and results. A program does not need to be lengthy or complicated to be effective. Educate everyone on the job-site about the waste management program. Keep in mind that a job-site recycling program can be site-specific – a program that works at one job-site may not work as well at another. A successful program should set Waste Management Goals such as reusing or recycling 50% of project wastes and a list of materials to be recycled.

Designate A Coordinator Identify one person responsible for site waste management and allot sufficient time for that purpose; or hire a person specifically for the task for large projects. Train this person not only to recognize and handle recyclables correctly, but to instruct others to do so.

Analyze Project Waste Based on the project type and size, use previous material purchasing records and waste disposal records from similar projects to estimate the quantity of waste material that will be generated. Estimate material quantities by weight. Also, include wastes from demolition phases of the project and determine when wastes will be generated over the course of the project. Here are some things to keep in mind:

- Wood, drywall and cardboard make up between 60 to 80% of job-site waste.
- Vinyl and metals are generated in small quantities but have good recycling value.
- Brick and asphalt waste are insignificant in volume but can be important in terms of weight.
- Cardboard waste is increasing as more components are shipped to builders over long distances.
- The largest share of Hazardous Waste is generated from painting, staining, and caulking.



Setting Up a Job-Site Recycling Program (continued)

Identify Disposal Options, including whether each material will be reused in place, reused elsewhere on site, salvaged, recycled or landfilled. Your company should describe the Material Handling Procedures, including the removal, separation, storage, and/or transportation required for each item. The City has an exclusive franchise agreement with Waste Management (WM) for handling trash, unless you self-haul it. Recycling can be picked up by WM or other self-hauled companies. There are three basic approaches to recycling, listed below, with increasing levels of builder involvement.

- **Job-site Co-mingled Recovery** Co-mingled recycle facilities accept mixed recyclables and retrieve the materials mechanically and/or manually. The builder puts all recyclables in a container and schedules service; the facility transports and tips the material. Fee structures are normally the same as for conventional disposal. For more information refer to *Co-mingled vs. Source Separated* on pg 2.
- **Job-site Separation** The builder is responsible for separating the material and scheduling container service; the recycling facility transports and tips the material. Savings can be achieved through the higher value of separated materials.
- **Self-haul** The builder handles all phases of waste management; separating, containers, transport, tipping. Disposal/recycling costs are determined by vehicle cost, tipping fees, and required labor. For more information refer to *Self-haul vs. Commercial Hauler* on pg 11.

Identify Recyclables Asphalt, concrete, cardboard, drywall, metals and wood are easy to recycle in Woodland. Recycling options also exist for carpet, plastic, and paint. Please refer to the *Builder's Directory* for recycling & reuse facilities.

Setting Up the Site Work with your recycler and crew to setup your site for maximum recycling. Quick tips:

- Provide separated bins for all recyclables, where space allows, and train all site personnel to use them, for the greatest resource recovery.
- Place recycling bins and trash bins near each other so trash is not thrown in the recycling bin.
- Clearly label the intended recycling bins with clear signage, in several languages or universal symbols. Post lists of what is and what is not recyclable.
- Place garbage bins and recycling bins close to point of waste generation.

Setting Up a Job-Site Recycling Program (continued)

Manage & Track the Program An effective recycling program includes occasional monitoring. Make sure to check bins periodically for contamination. Regularly check the wastes in the garbage dumpsters to see if recyclables are being thrown away or if there are additional materials that could be recycled. Also, call the recycler before bins are full to arrange for pick-up. Tracking the quantities and cost savings of diverted materials is important for future estimating. Once construction has started keep the receipts from recycling and garbage disposal to attach to your WRRR. Copy receipts and give them to your company's estimating department for planning future waste management budgets.

Some Basics About Disposal Costs

There are three costs that make up waste management: handling, transporting, and tipping.

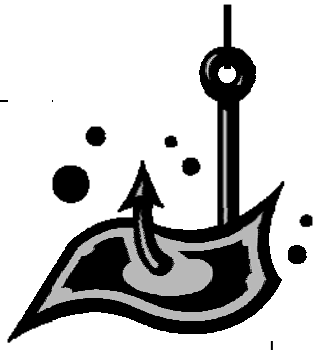
- **Handling –** It takes about 2.4 hours per ton to gather and carry construction waste to a dumpster. However, this number can vary based on the type of material and the distance from the job-site to the bin.
- **Transporting –** Trucking costs include ownership, operation, and the driver's labor.
- **Tipping –** Tipping is the fee charged by the facility that receives the material. Landfills and recycling facilities can charge by volume (cubic yard) or by weight (ton). Use the Conversion Factor sheet in Appendix C.

Fee Structures – Haulers cover the costs of trucking and tipping by charging builders based on time – a daily or monthly container rental fee; weight – a per ton charge; volume – a cubic yard; or a combination of the three.

Future Costs – Your disposal costs are largely dependent on local landfill capacities and state/federal solid waste regulations. Developing new approaches to waste management may pay back in the long run even if current conditions do not warrant them.

Fishing out dollars from your dumpster

Before and during construction, take a proactive role to reduce disposal costs by finding "dollars in your dumpster."
The City of Woodland has put together a *Builder's Directory* containing recyclers in the area that recycle construction materials such as asphalt, concrete, drywall, cardboard, metals and wood. Other materials recycled locally include ceiling tiles, plastic film, and carpet.



Turn trash into treasure: *Builder's Directory*. Online at www.cityofwoodland.org

Self-Haul Vs Commercial Hauler

Decide whether to self-haul recyclables to the recycling facility or contract with a commercial recycling hauler.

Self-hauling involves the builder handling all phases of waste management; separation, containers, transport, tipping. Self-hauling requires the most commitment in terms of time, effort and information gathering. Self-hauling requires recyclable materials to be collected on-site in piles or temporary containers and then be taken to recycling facilities in the contractor's own vehicles. Builders large enough to dedicate a crew and equipment to full-time waste management or small enough to make waste management an integral part of daily business trips are best suited to self-hauling. Advantages to the self-haul approach include elimination of any middlemen and first hand knowledge of how efficiently materials are used at the jobsite.

Contamination is the key to successful recycling. Be sure that your idea of a "clean" load is the same as your recyclers'.

Using a **commercial hauler** works well on projects where large quantities of materials are generated, such as demolition, multifamily, and commercial projects. Some recyclers offer smaller containers for home construction projects. There are two different ways you can take advantage of using a commercial hauler to haul your recyclables:

1. **Commingled Recovery**.
2. **Job-site Separation**-only works when the builder and subcontractors keep the loads clean and separated.

Determine if you will co-mingle recyclables or source-separate them for collection. Refer to the box *Co—mingled Vs. Source Separated* on page 2 for more information.

STOP WASTE BEFORE IT STARTS

Consider These Tips:

Reduce

- Avoid leftovers – measure twice and cut once.
- Choose materials that are durable so you don't have to replace them frequently.
- Use energy efficient practices and products.

Reuse

- Instead of traditional demolition, consider salvage and deconstruction, by selectively and carefully removing materials for reuse.
- Consider remodeling or retrofitting existing buildings for new use.
- Allow time in your schedule for salvage and recycling.
- Use salvaged materials in remodeling or construction.
- Donate surplus materials.

Recycle

- Assign a member of your crew to take responsibility for the program.
- Recycling can save you money.
- Clean loads are the key to successful recycling.
- Early on, set up the site for reuse and recycling.

Troubleshooting Your Program

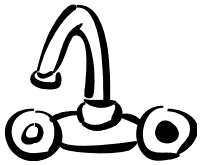
Preventing waste and recycling on a job-site reduces disposal and supply costs. However, even the best programs may encounter difficulties. Here are solutions to some of the challenges of developing and implementing a Waste Management Program.

Problems	Solutions
Managing Your Program- What is a cost-effective way to manage a successful waste management program?	• Designate a person to manage the details of creating and implementing the program. • Look for members of your crew/staff who may have an interest in recycling. • For large projects, form a waste management team consisting of key people such as the owner, designer, project managers, and site supervisor.
Involving Subcontractors & Suppliers- What is the best way to handle the wastes subcontractors and suppliers generate?	• Require subcontractors and suppliers to use the recycling and disposal bins on-site. This allows the most control of recycling activities. Be sure to provide recycling for the variety of wastes generated. • Ask the subcontractors and suppliers to take back and recycle their own waste, but require written reports. Since many subcontractor and supplier wastes are similar, it is easy to separate the wastes for recycling. • Use a combination of methods. Obtain reports from recycling haulers. • Involve them in choosing convenient locations for recycling bins.
Finding Appropriate Space - How can you find space to separate recyclables on space-constrained sites?	• Choose smaller containers and more frequent collection. • Use scrap lumber to divide one container into separate compartments for storing recyclables. • Ask recycling service providers about single containers with multiple compartments. • Rent a trailer for the major recyclable material generated in the first phase of construction. When full, haul it directly to the recycler. Bring it back to collect the next quantity of materials generated. • Use trash cans and other small containers to collect recyclables generated in smaller amounts. • Consider co-mingling small quantities of wood, cardboard, and metals to make one larger load.
Promotion & Education- How do you educate your crew and subcontractors? How do you ensure their participation?	• Treat waste management like a safety program. Integrate recycling training into the safety education, or design a separate recycling education program. • Share the success. Let subcontractors and crew know how effective they have been by regularly posting the volumes of materials reused or recycled. • Use signage to communicate, remembering to use simple clear instructions and include pictures to help non-English speaking workers. • Include everyone in the process. Encourage suggestions on more efficient methods, or additional materials that can be recycled.
Preventing Contamination- How can you prevent contamination of recyclables?	• Laminate a poster with pictures describing the recycling program and post it in visible locations. • Clearly label the recycling bins. Post lists of what is and is not recyclable. • Provide enough trash bins to collect non-recyclable items. Have them emptied regularly so the overflow does not end up in the recycling bin. • Consider locating bins in a locked or supervised area, or having bins with lids to discourage contamination by the public. • Conduct regular site visits to verify that bins are not contaminated. Provide reports and educate subcontractors and crew on the results. • Dump out contaminated loads and have the subcontractor and/or crew pull out the contaminants themselves.

Salvage & Reuse of Building Materials

DECONSTRUCTION, also referred to as **SALVAGE,** is an environmentally responsible alternative to conventional building demolition. Salvage and recycling during demolition typically makes dollar sense. Reusing items on-site and donating or selling salvaged items cuts waste and reduces purchasing costs, and sometimes brings in revenue. Salvage and sale of metals, valuable historic materials and reusable fixtures can actually produce a small income from demolition. Separating recyclable materials also reduces the volume, weight and cost of landfill dumping.

In a deconstruction, hazardous materials are removed, reusable building materials are salvaged, demolition materials are recycled and only a small portion of waste ends up in the landfill. To successfully deconstruct a building for salvage, you may have a demolition contractor identify and remove the useable material or you may extract the material and drop it off at a salvage yard.



Assess Reuse Potential Start Early! Advance planning is crucial for success. Before demolition, identify potentially reusable or salvageable items for either on-site or off-site sources. Discuss proposed reuse ideas with the project owner, architect, and designer.

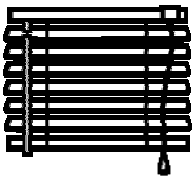
Research Salvage and Reuse Options Here are some ways to access the market: Refer to the *Builder's Directory* for resources.

- Contact a salvage company who will come on-site to remove valuable materials.
- Take materials to one of the reuse stores in the area.
- List the items in a materials exchange.
- Advertise reusable items in the newspaper.

Develop a Plan A plan should include:

- List of items being reused in place or elsewhere on-site
- List of items for reuse off-site through salvage, resale, or donation.
- Plan for protecting, dismantling, handling, storing and transporting the reuse items.

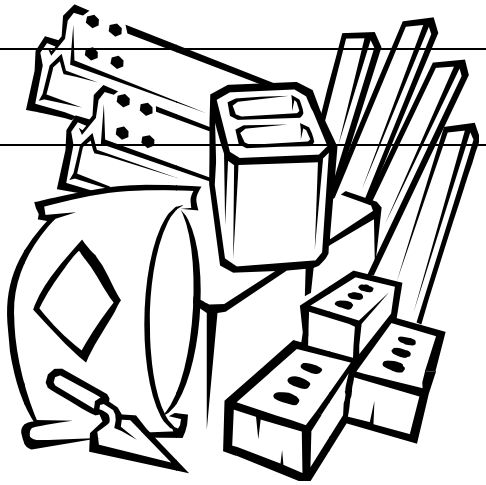
TYPICAL SALVAGEABLE MATERIALS:
Appliances
Bricks
Cabinets
Carpeting
Ceiling Tiles
Doors
Lighting Fixtures
Lumber
Metal Framing
Paint
Plumbing Fixtures
Siding
Windows
Wood Flooring and Fencing



CAUTION

- Care is required to prevent damage to reusable items and contamination of recyclables.
- Additional time may be required for salvage and separating compared to landfill disposal.

Using Recycled-Content Building Materials



Recycled-content building materials are durable and quality products, competitively priced with conventional materials, and they help conserve natural resources such as timber and oil.

Many common building products, like blown-in cellulose insulation, made from reclaimed newspapers, have contained recycled materials for years. New products using recycled materials, such as carpet and plastic lumber are being developed every day.

HOW TO BUY RECYCLED

- Obtain information on recycled products. Refer to *Appendix E, Where to Get More Information, page 24,* for help. Also, contact suppliers and manufacturers for product specifications and samples.
- Consistently communicate your interest in recycled-content building materials in your specifications, policies, and in your job-site meetings.
- Look for products with the highest recycled-content available, especially postconsumer content that meets your strength and durability specifications.
- Look for recycled-content products for your office or job trailer. Copy paper, toner cartridges, and desk supplies are readily available with recycled-content.

POSTCONSUMER Vs PRECONSUMER

Postconsumer recycled-content products contain materials that have been used by consumers, like a contractor, and collected for processing.

Preconsumer or postindustrial recycled-content products contain "waste" materials created as a byproduct of manufacturing that are collected and reincorporated into the manufactures product.

RECYCLED-CONTENT BUILDING PRODUCTS

The following are just a few of the building products made with recycled materials:

Asphalt	Exterior Sheathing	Flooring	Recycling Containers
Building Blocks	Fences/Posts	Glass	Roofing
Building Panels	Fiberboard	Lumber	Structural Steel
Cellulose Insulation	Fiberglass Insulation	Paint	Underlayment
Compost	Fill Material	Parking Stops	Wallboard
Concrete	Floor Joists	Pilings	
Ductwork	Floor Mats	Plastic Lumber	

APPENDIX A:

Waste Management At-A-Glance

Waste Recycling Options	Description	Advantages	Disadvantages
Co-mingled Recovery	• Separation of co-mingled waste and recovery of recyclables off-site. Materials contained on-site in conventional manner.	• Little or no builder involvement. • No job-site separating, which lessens impact of drive-by contamination.	• Invisible system – does not promote waste reduction or recycling. • Typically available only where tipping fees >$50/ton.
Source Separation	• Subcontractors place waste and recyclable material in separate containers.	• Highly visible system. • May be available from conventional haulers.	• More containers on site. • Requires compliance of subcontractors to control contamination.
Self-Haul	• Builder handles, transports, and tips all materials.	• Eliminates the large roll-off container on site. • Reduced opportunity for drive by contamination. • Creates opportunity for reuse on site.	• Requires time, knowledge of recycling outlets. • Substantial vehicle wear and tear.

Sample Waste Reduction & Recycling Plan

City of Woodland

WASTE REDUCTION RECYCLING - PLAN
Construction & Demolition Ordinance (C&D)
☐ Construction ☐ Demolition
Submittal Date: mo_____day_____yr_____

Applicant: Submit this Plan to the Community Development Dept with your building permit application.
Questions: C&D Conservation Coordinator 530-406-5113

---CITY USE ONLY---
☐ Plan Approved Date: _____
☐ Plan Denied Date: _____
Returned for additional information.
☐ Re-submittal Date _____

Applicant Name:		Company Name:	
Mailing Address: Street		City	ST Zip
Phone # / /		Fax # / /	

☐ Single-family (3 or more homes)	Project Valuation$	☐ Multi-family (4 or more units per bldg)	Project Valuation$
Project Title:		Project Title:	
Address	Lot #	Address	Lot #
Address	Lot #	Address	Lot #
Address	Lot #	Address	Lot #
Address	Lot #		
Address	Lot #		
Address	Lot #	☐ Commercial (> or = to 1000 Sq Ft)	Project Valuation$
Address	Lot #	Project Title:	
Address	Lot #	Address	Lot #
Address	Lot #	Address:	Lot #
Address	Lot #	Address:	Lot #

More addresses allowed. Attach additional sheets if necessary.

APPLICANT FEES INFORMATION	--CITY USE ONLY --
C&D ADMIN FEES: Collected with building permit application fees: Total # of Permits on this Plan _____ X $275 each = Total C&D Admin Fees $ _____	Admin fees date paid _____ Check #_____ By _____
C&D DEPOSIT: Collected by separate check; at the same time 1st permit is issued. Standard Deposit per Plan $1000. If 3 or more Plans in action Deposit is $0. If 3% rule applies contact C&D Coordinator.	Deposit date paid _____ Check #_____ By _____ Please footnote permit# on this check

WASTE REDUCTION RECYCLING - PLAN (side 2)

For help: Recovering materials at your jobsite or questions concerning this form; please refer to your C&D packet materials; OR contact C&D Conservation Coordinator 530-406-5113.

Complete sections below: Check the correct box☑. Identify materials for reuse, recycle or disposal. Identify if self-haul. List the Service Provider or Facility-destination and the corresponding phone #.
(Remember, this is your "plan". You can make changes on your final "report".)

MATERIAL	Reuse	Recycle	Disposal	Self-haul	Service Provider Or Facility-destination of material	Phone # xxx/xxx/xxxx
Asphalt / Concrete						
Brick / Tile						
Cardboard						
Carpet / Padding						
Dirt / Sod						
Doors / Gates						
Gypsum / Dry wall						
Glass / Windows						
Metals / Scrap						
Roofing						
Rock / Stone /Sand						
Stucco						
Wood / Lumber						
C&D Sort Facility						
Trash	N/A	N/A				
Trash / Self-haul	N/A	N/A		√	Waste Management of Woodland	530-406-4332

Will this project require the use of sub-contractors? ☐ Yes ☐ No. If Yes, briefly state how you plan to inform and ensure participation by the sub-contractor(s) at your project site: _____

_____

I have read the City of Woodland C&D Ordinance. I acknowledge that I am responsible for complying with the requirements of the C&D Ordinance. A permit(s) will not be issued until the completed **Waste Reduction Recycling Plan, and fees** are submitted and approved.

Applicant Signature: _____ **Date:** _____

Sample Waste Reduction & Recycling Report

City of Woodland

WASTE REDUCTION RECYCLING - REPORT
Construction & Demolition Ordinance (C&D)
☐ Construction ☐ Demolition
Submittal Date: mo_____day_____yr_____

Applicant: Submit Reports by mail or fax to:
C&D Conservation Coordinator
City of Woodland Public Works
42929 County Road 24
Woodland, CA 95776
ph/530-406-5113; fax/530-666-1266

---CITY USE ONLY---
☐ Full Compliance - Full deposit refund
☐ Good Faith Effort - 50% deposit refund
☐ Non-Compliance - No refund.
Refer to C&D Ordinance

Which "Recycling Plan" does this "Report" match?	☐ 1st quarter Jan/Feb/March Due by: April 30
	☐ 2nd quarter April/May/June Due by: July 31
Original Plan Project Title:	☐ 3rd quarter July/Aug/Sept Due by: Oct. 31
Original Plan Submittal Date: (mo) (day) (yr)	☐ 4th quarter Oct/Nov/Dec Due by: Jan. 31
Type of project: ☐ Single-family ☐ Multi-family ☐ Commercial	☐ End of Project. Due 30 days after end of project

Applicant Name:	Company Name:		
Mailing Address: Street	City	ST	Zip
Phone # / /	Fax # / /		

Conversion rates for completing side 2. Numbers are in pounds (lbs). For more conversion factors see: www.calrecycle.ca.gov/condemo/

Asphalt/Paving crushed	1 cubic yard = 1,380	Glass broken	1 cubic foot = 80-100	Rock loose	1 cubic yard = 2,570
Concrete scrap loose	1 cubic yard = 1,855	Glass/Windows	1 cubic foot = 157	Roofing/Wood shingle	1 cubic yd = 435.3
Brick whole	1 cubic yard = 3,024	Gypsum solid	1 cubic foot = 142	Sand loose	1 cubic yard = 2,441
Cardboard flat loose	1 cubic yard = 50.08	Metal/Aluminum scrap	1 cubic yard = 175	Stone or gravel	1 cubic foot = 95-100
Cardboard whole boxes	1 cubic yard = 16.64	Metal/Ferrous scrap	1 cubic yard = 906	Wood/Lumber scrap	1 cubic yard = 329.5
Cardboard compacted	1 cubic yard = 400	Metal/Copper scrap	1 cubic yard = 1093.52	Pallet wood or plastic	Avg 48" x 48" = 40
Carpet & padding loose	1 cubic yard = 84.4	Metal/Brass scrap	1 cubic yard = 906.43	Plywood sheet 2' x 4'	1 cubic yard = 776.3
Ceramic tile loose 6"x6"	1 cubic yard = 1,214	Metal/Paint can empty	5 gallon = 2.21	Yard trimmings mixed	1 cubic yard = 108
Dirt loose	1 cubic foot = 76	Metals/Steel trimmings	1 cubic foot = 75–50	Large limbs/stumps	1 cubic yard = 1,080

For help: Recovering materials at your jobsite or questions concerning this form; please refer to your C&D packet materials; OR contact, C&D Conservation Coordinator, 530-406-5113.

WASTE REDUCTION RECYCLING - REPORT (side 2)

Complete sections below: Enter total lbs in each material box reused, recycled or disposed. Identify if self-haul ☑. List the Service Provider, or facility destination of each material and the corresponding phone #.
Attach ALL receipts, gate tags, weight certificates or other verifying documentation.

MATERIAL	Reuse lbs	Recycle lbs	Disposal lbs	Self-haul	Service Provider Or Facility-destination of material	Phone # xxx/xxx/xxxx
Asphalt / Concrete						
Brick / Tile						
Cardboard						
Carpet / Padding						
Dirt / Sod						
Doors / Gates						
Gypsum / Dry wall						
Glass / Windows						
Metals / Scrap						
Roofing						
Rock / Stone /Sand						
Stucco						
Wood / Lumber						
C&D Sort Facility						
Trash	N/A	N/A			Waste Management of Woodland	530-406-4332
Trash / Self-haul	N/A	N/A		√		
TOTAL LBS					Enter total pounds (lbs)	
TOTAL TONS					Convert lbs to tons (2000 lbs = 1 ton)	

Diversion Calculation: Reuse _____ + Recycle _____ = Diversion _____ Tons

USE TOTAL TONS Diversion _____ + Disposal _____ = Generation _____ Tons

Diversion _____ / Generation _____ X 100 = Diversion Rate _____%

I acknowledge that I am responsible for complying with the requirements of the City of Woodland C&D Ordinance. A final inspection will not be scheduled until the completed **End of Project Waste Reduction Recycling REPORT** is reviewed.

Applicant/Owner Signature: **Date:**

Sample Receipts

City of Woodland Construction & Demolition Debris Ordinance Waste Reduction and Recycling - **RECEIPT** Date: mo_____day_____yr_____	**Applicant:** Submit this **Receipt** with your Waste Reduction and Recycling Report. Use for facilities/company/individual that do not have scales, or do not generate weight tags, or receipts. For questions concerning this form contact: Conservation Coordinator at 530-406-5113.

This top section should match information on Waste Reduction and Recycling Plan & Report:

Applicant/Owner Name:	Company Name:
Applicant/Owner Mailing Address: (Street)_____ (City)_____ (ST)_____ (Zip)_____	
Phone # _____/_____/_____	Fax # _____/_____/_____

Company/Facility/Individual where material(s) delivered to or received by:

Check Type(s): ☐Recycle Center ☐Salvager ☐Landfill Operator ☐End User				
Name:	Street:	City:	ST:	Zip:
Signature (required to validate receipt):			Phone: / /	

Identify material type, weight, usage, date that materials were delivered/received:

Material type	Weight: pounds or tons*	How material will be used	Date delivered or received
***Sample**: old wood fencing*	*500 lbs*	☐Recycle ☑Reuse ☐Trash	*June 1, 2006*
		☐Recycle ☐Reuse ☐Trash	
		☐Recycle ☐Reuse ☐Trash	
		☐Recycle ☐Reuse ☐Trash	

*Note: refer to the conversion factors on the Waste Reduction and Recycling Report, or www.ciwmb.ca.gov/ConDemo

City of Woodland Construction & Demolition Debris Ordinance Waste Reduction and Recycling - **RECEIPT** Date: mo_____day_____yr_____	**Applicant:** Submit this **Receipt** with your Waste Reduction and Recycling Report. Use for facilities/company/individual that do not have scales, or do not generate weight tags, or receipts. For questions concerning this form contact: Conservation Coordinator at 530-406-5113.

This top section should match information on Waste Reduction and Recycling Plan & Report:

Applicant/Owner Name:	Company Name:
Applicant/Owner Mailing Address: (Street)_____ (City)_____ (ST)_____ (Zip)_____	
Phone # _____/_____/_____	Fax # _____/_____/_____

Company/Facility/Individual where material(s) delivered to or received by:

Check Type(s): ☐Recycle Center ☐Salvager ☐Landfill Operator ☐End User				
Name:	Street:	City:	ST:	Zip:
Signature (required to validate receipt):			Phone: / /	

Identify material type, weight, usage, date that materials were delivered/received:

Material type	Weight: pounds or tons*	How material will be used	Date delivered or received
***Sample**: old wood fencing*	*500 lbs*	☐Recycle ☑Reuse ☐Trash	*June 1, 2006*
		☐Recycle ☐Reuse ☐Trash	
		☐Recycle ☐Reuse ☐Trash	
		☐Recycle ☐Reuse ☐Trash	

*Note: refer to the conversion factors on the Waste Reduction and Recycling Report, or www.ciwmb.ca.gov/ConDemo

APPENDIX C:

Commercial Recycling Economics Worksheet

INSTRUCTIONS: Use this section for calculating the savings or cost of recycling materials through a commercial hauler.

- List the materials that will be recycled through a commercial hauler and the estimated tons or cubic yards of each on the "**Commercial Hauler Recycling Economics Worksheet.**"
- Determine what size containers will be needed based on available space on-site. Use the proposed container size and the estimated volume of each material to calculate the number of loads of recycling the project will generate. (example: 100 cu. yards drywall / 40 cu. yard container = approximately 3 loads) (**No. of Loads)**
- Based on the construction schedule, estimate the number of months recycling containers will be needed for each material (**No. of Months**).
- Collect the following information from local commercial recyclers and garbage companies. Add this information to the worksheet:
  - The tipping fee in tons or cubic yards for each material (**Tipping Fee**)
  - The hauling fee to the recycling/garbage facility (**Hauling Fee**)
  - The monthly rental for the selected container (**Cont'r Rental**)
- Use the above information to calculate the cost of recycling (**Total Cost)**.
- Calculate what it would cost to dispose of the materials as garbage instead of recycling them (**Cost of Not Recycling**). Use the total number of tons or cubic yards and current garbage costs.
- Determine the savings or cost of recycling by subtracting the cost of recycling from the cost of not recycling (**Savings or Cost of Recycling**).

Recycling Economics Sample: Commercial Hauler Source Separated

Create your own spreadsheet to see if you could be saving money by recycling on your job-site!

Cost of Recycling

Material	Quantity	Tip Fee	Subtotal 1 (quantity x fee)	Number of Loads	Hauling Fee	Subtotal 2 (loads x haul fee)	No. of Months	Cont'r Rental	Subtotal 3 (months x rental)	Total Cost
Asphalt										
Wood										
Drywall										
Cardboard										
Metals										
Landclearing										
Aluminum										
Totals										

Cost of Not Recycling

Material	Quantity	Tip Fee	Subtotal 1 (quantity x fee)	Number of Loads	Hauling Fee	Subtotal 2 (loads x haul fee)	No. of Months	Cont'r Rental	Subtotal 3 (months x rental)	Total Cost
Garbage										

Savings or Cost of Recycling

(Total Cost of Not Recycling)	-	(Total Cost of Recycling)	=	Total Savings

APPENDIX C:

Self-Haul Recycling Economics Worksheet

INSTRUCTIONS: Use this section for calculating the savings or cost of self-hauling materials to the recycling facility.

- List the materials that will be self-hauled to the recyclers and the estimated tons or cubic yards of each on the "Self-haul Recycling Economics Worksheet" (**Material**).
- Divide the estimated quantity of each recyclable by the per load capacity of the vehicle used to haul the recyclables to determine how many trips to the recycling facility will be necessary (**No. of Loads**).
- Collect the following information from the facilities where the recyclables will be delivered. Add this information to the worksheet.
  - The tipping fee in tons or cubic yards for each material (**Tipping Fee**).
  - The distance of the drop-off-site from the project in travel time (**Hours per Load**).
- Fill in the hourly labor rate for hauling recyclables to the drop-sites. If desired, include any estimated costs for the vehicle, such as gasoline (**Cost/Hour**).
- Use the above information to calculate the cost of recycling on the worksheet (**Total Cost**).
- Calculate what it would cost to dispose of the materials as garbage instead of recycling them (**Cost of Not Recycling**). Use the total number of tons or cubic yards and current garbage costs.
- Determine the savings or cost of recycling by subtracting the cost of recycling from the cost of not recycling (**Savings or Cost of Recycling**).

Recycling Economics Sample: Self-Haul

Create your own spreadsheet to see if you could be saving money by recycling on your job-site!

Cost of Recycling

Material	Quantity	Tip Fee	Subtotal 1 (quantity x fee)	Number of Loads	Hours per Load	Cost/hour (labor x hour x costs)	Subtotal 2 (loads x hours x costs)	Total Cost
Concrete								
Cardboard								
Wood								
Drywall								
Asphalt								
Mixed Metals								
Totals								

Cost of Not Recycling

Material	Quantity	Tip Fee	Subtotal 1 (quantity x fee)	Number of Loads	Hours per Load	Cost/hour (labor x hour x costs)	Subtotal 2 (loads x hours x costs)	Total Cost
Garbage								

Savings or Cost of Recycling

(Total Cost of Not Recycling - (Total Cost of Recycling) =	Total Savings

APPENDIX D:

Conversion Factors

Conversion factors provided by The Department of Resources Recycling and Recovery. Please refer to www.calrecycle.ca.gov for more conversion factors.

Asphalt, crushed:	1 cubic yard = 45 lbs
Asphalt/paving, crushed:	1 cubic yard = 1,380 lbs
Concrete, scrap, loose:	1 cubic yard = 1,855 lbs
Brick, whole:	1 cubic yard = 3,024 lbs
Cardboard:	
flattened boxes, loose:	1 cubic yard = 50.08 lbs
whole boxes:	1 cubic yard = 16.64 lbs
Carpet & padding, loose:	1 cubic yard = 84.4 lbs
Cement, bulk	1 cubic foot = 100 lbs
Ceramic tile, loose 6"x 6":	1 cubic yard = 1,214 lbs
Concrete, scrap, loose:	1 cubic yard = 1855 lbs
Dirt, loose:	1 cubic foot = 76 lbs
Fiberglass insulation, loose	1 cubic yard = 17 lbs
Glass, broken:	1 cubic foot = 80–100 lbs
Gravel, loose:	1 cubic yard = 2,565 lbs
Gypsum, solid:	1 cubic foot = 142 lbs
Metal:	
Aluminum scrap, whole:	1 cubic yard = 175 lbs
Metal scrap (Ferrous):	1 cubic yard = 906 lbs
Copper, scrap:	1 cubic yard = 1,093.52 lbs
Brass, scrap:	1 cubic yard = 906.43 lbs
Paint can (Empty):	5 gallon = 2.21 lbs
Rock, loose:	1 cubic yard = 2,570 lbs
Roofing/shake wood shingle:	1 cubic yard = 435.3 lbs
Stone or gravel:	1 cubic foot = 95–100 lbs
Wood:	
Scrap, Loose:	1 cubic yard = 329.5 lbs
Pallet, wood 48" x 48":	40 lbs
Plywood, sheet 2' x 4':	1 cubic yard = 776.3 lbs
Yard trimmings, mixed:	1 cubic yard= 108 lbs
Large limbs & stumps:	1 cubic yard = 1,080 lbs

APPENDIX E:

Where to Get More Information

FOR TECHNICAL ASSISTANCE

- **City of Woodland-**
  Environmental Operations
  42929 County Road 24
  (530) 406-5113
  www.cityofwoodland.org

- **Waste Management**
  (530) 662-8748
  www.wm.com

- **Yolo County Central Landfill**
  (530) 666-8729
  www.yolocounty.org

ONLINE RESOURCES

- **Department of Resources Recycling and Recovery:**
  C&D Debris Recycling
  www.calrecycle.ca.gov/ConDemo/

  C&D Recyclers Database
  www.calrecycle.ca.gov/ConDemo/Recyclers/

- **Environmental Protection Agency EPA:**
  www.epa.gov/epaoswer/non-hw/debris-new/index.htm

  EPA Recycled – Content Building Materials
  www.epa.gov/cpg/

MATERIAL EXCHANGE

- **California Materials Exchange (CALMAX)**
  (877) 520-9703
  www.calrecycle.ca.gov/calmax

- **Excess Access**
  www.excessaccess.org

- **Recycler's World**
  www.recycle.net

- **Environmental Protection Agency**
  www.epa.gov/jtr/comm/exchnat.htm

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