

# Deconstruction Waste Management

*Reduce waste and increase salvaged materials for reuse*



## The Impact

The County of San Mateo Office of Sustainability stated in 2022 that nearly 30 percent of waste sent to the landfill is from construction and demolition debris. Deconstruction offers a significant form of waste reduction. Additionally, deconstruction reduces the necessity for some new manufacturing and provides the opportunity for new markets selling salvaged materials at discount rates.

## Description

Common construction practices involve demolishing an existing structure and disposing of the debris in a landfill. Deconstruction, also referred to as salvage or soft demolition, is a cost-effective and environmentally responsible alternative to conventional building demolition. Deconstruction is the systematic disassembly of a building or structure, often performed in the reverse order of construction, and is a sustainable alternative to demolition. Deconstruction can result in up to 95 percent of materials being recovered for reuse or recycling.

Deconstruction ordinances mandate or strongly encourage the adoption of this careful disassembling of buildings. CalRecycle offers resources on developing a Model Construction and Demolition (C&D) Diversion Ordinance, and the County of San Mateo Office of Sustainability updated its Construction, Deconstruction, and Demolition Guide for San Mateo County in 2022. (Links to both are provided below in the Resources section.)

## Where It's Been Implemented

Palo Alto, Calif., has an ordinance effectively banning contractors from demolishing entire buildings, which went into effect in July 2020. Other cities such as Portland, Ore., and Milwaukee, Wisc., have similar laws in place. In San Mateo County, several cities require that 100 percent of inert materials be recycled (Brisbane, Redwood City and South San Francisco) or have enacted ordinances that are more stringent than California law requires.

Business owners such as Chris Garrett of Devil's Canyon Brewing Co. in San Carlos, Calif., have already incorporated reuse and deconstruction salvage into their “business as usual” practices. His brewery is almost entirely constructed from recycled and repurposed materials, including equipment from large businesses.

### **Key Drivers**

Waste reduction is a principal tenet of sustainability. San Mateo County has taken action toward achieving zero waste status, but much of the focus so far has been placed on items such as single-use plastic bags and straws — and lately on food waste. Addressing the process of construction and demolition has the potential for great impact. Action is even more urgent now for the county because its only landfill, Ox Mountain, is expected to reach capacity in 2039.

The City of Palo Alto estimates that more than 40 percent of its landfill debris is construction or demolition materials. About 19,000 pounds of waste are created annually from these projects, so better management practices are a priority.

Several cities throughout San Mateo County already have ordinances in place for recycling construction and demolition materials. However, Palo Alto’s 2020 ordinance bans the practice of demolition (only allowing for deconstruction), estimating that up to 95 percent of the materials can be recovered for reuse or recycle with deconstruction techniques.

### **Key Factors for Success**

Because demolition is faster and cheaper than deconstruction, incentives will help encourage contractors and builders to spend the extra time to effectively salvage materials for reuse. Deconstruction may cut future costs for building companies and contractors by increasing their access to viable and cost-effective salvage materials or by decreasing disposal costs after the project. Additionally, the donation or sale of salvaged material can offset the additional cost of deconstruction through tax deductions and income. Deconstruction for renovations should be considered, as smaller internal projects still present an opportunity for deconstruction and material recovery. Another key factor for success is including someone, preferably a supervisor or project manager, on the job who has deconstruction experience and can identify and help solve problems as they occur. It is also important to provide workers with education about the deconstruction process and how to handle any hazardous or toxic materials they may encounter.

### **Key Obstacles**

Deconstruction takes more time than demolition and is more expensive. Pilot studies in Palo Alto showed that deconstruction of two buildings took between 10 and 15 days with a crew of four to eight workers, and the cost ranged from \$22 to \$34 per square foot. In comparison, demolition of a building takes a few days and a crew of two to three, and costs between \$8 and \$12 per square foot to complete.

Current ordinances in some cities in San Mateo County already require salvaging materials, thus lengthening the demolition process. Some cities, such as Burlingame, even require builders to wait a few days prior to demolition to allow for materials to be salvaged.

Tax deductions can more than make up for the initial cost of deconstruction. Markets in place for the salvaged materials can also help mitigate deconstruction costs.

### **Timeline to Implementation**

The City of Palo Alto adopted its deconstruction ordinance in July 2019. The ordinance went into effect on July 1, 2020, for total demolitions of commercial and residential projects. The timing and

scope of expanding the ordinance to cover all projects and different value increments is still under consideration and will be dependent on lessons learned from the initial phase.

## References and Resources

- Chris Garrett, Owner, Devil's Canyon Brewing Co., [chris@devilscanyon.com](mailto:chris@devilscanyon.com), 650-400-0650
- City of Palo Alto, Construction & Demolition, [CD@CityofPaloAlto.org](mailto:CD@CityofPaloAlto.org), 650-838-2828 or [zerowaste@cityofpaloalto.org](mailto:zerowaste@cityofpaloalto.org), 650-496-5910
- Office of Sustainability, San Mateo County. "[Construction, Deconstruction, and Demolition Guide for San Mateo County](#)," 2022
- [CalRecycle. Model Construction and Demolition Ordinance](#)
- "[How to Start Deconstructing and Stop Demolishing Your City's Buildings](#)," C40 Cities Climate Leadership Group, Implementation Guides January 2021
- "[Palo Alto Takes Aim at Demolition.](#)" Palo Alto Weekly, July 9, 2019
- [Build Reuse](#)
- <https://www.smcsustainability.org/wp-content/uploads/Ox-Landfill-Capacity.pdf>

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