

Designing and Implementing a Deconstruction Ordinance

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DESIGNING AND IMPLEMENTING A DECONSTRUCTION ORDINANCE

Deconstruction ordinances have been passed by a number of cities, and are under serious consideration in others. Such ordinances take varying approaches. Those range from requiring only surveys, with the hope that owners and building contractors will recognize the value of salvaged building materials for reuse through resale or donation, to mandating the deconstruction of certain types of buildings.

I bring over 26 years as a deconstruction contractor and salvaged building-materials distributor to the writing of this paper, which I believe addresses the most critical issues surrounding deconstruction ordinances and encourages those considering them to more fully understand the business of deconstruction — including what it can and cannot accomplish.

Benefits

The advantages of deconstruction (as opposed to demolition) differ somewhat from city to city, county to county and state to state. However, these five benefits are common to all areas:

Waste. The composition of the municipal solid waste stream (MSW) has been studied for years by governments and various NGOs. These studies show that construction and demolition debris (C&D) represents between 25 and 50 percent of MSW. Further, over the last 30 years, according to the EPA, the construction portion of C&D has shrunk to eight to 10 percent. The remainder comes from demolition.

In most, but not all, U.S. and Canadian locations, the diversion of concrete from the waste stream has helped reduce the impact of demolition waste on landfills. Still, the long economic expansion experienced since 2008 has continued to push C&D to higher and higher volumes.

Environment. Besides reducing the strain on landfills, deconstruction mitigates several environmental contaminants. The two most noticeable are noise and hazardous waste. Noises are layered, meaning that one noise may mask another, but does so only by adding to the total decibels. For example, the noise from a diesel fueled excavator may mask the noise of demolishing a building, but the stress on neighbors and the damage to eardrums comes from both, along with other noise irritants.

Asbestos and lead paint are even more compromising. While all buildings must be tested for asbestos, sometimes testing identifies the presence of asbestos, and abatement is accomplished, only to discover more asbestos during deconstruction. This recently occurred during a San Mateo County deconstruction training. The class was halted in the contaminated portion of the building pending full abatement. If this house had been demolished, the remaining asbestos would have remained undiscovered, with no follow-up abatement, and this hazardous material would have ended up in the air or soil. Similarly, the handling of lead painted surfaces is covered in both EPA and OSHA regulations, but only deconstruction can properly separate and safely handle this dangerous contaminant.

Energy. In 2010, Forest Products Laboratory, a division of the U.S. Department of Agriculture, conducted a nationwide study comparing the energy consumed by using virgin lumber versus salvaged lumber for flooring. The results were startling even to those of us who participated in the study. Using virgin lumber consumed 11 to 13 times more energy than did salvaged lumber. Now consider other building materials, such as cabinets, doors and windows. Besides wood,

DESIGNING AND IMPLEMENTING A DECONSTRUCTION ORDINANCE

these products contain extractive minerals, essential components of such materials as aluminum and steel, so it's safe to assume that they consume even more energy than wood alone, when made from virgin materials.

Employment. By definition, deconstruction is a labor intensive process requiring two-to-four times as many people per job as demolition.

A deconstruction crew with three to eight members, including a skilled leader and a mix of semi-skilled and unskilled workers, can easily disassemble and salvage the reusable components of a 2,000 square-foot house, in 12 to 15 days. In addition to the deconstruction crew, the project would employ an excavator operator, a truck driver and one laborer to remove the foundation and hardscape.

Mechanical demolition of the same house would typically employ a machine operator, an excavator, a truck driver to haul the debris, and a person enforcing safety practices and dust control over a two-day period.

Deconstruction work is often classified as an entry-level position, ideal for individuals who want to advance to well-paying positions in other trades. In the past 25 years, hundreds, if not thousands, of untrained workers have started as modestly paid deconstruction workers, moved up through the ranks and graduated to higher skilled and salaried jobs in construction.

Further, employment benefits extend beyond the jobsite. Additional workers are needed to unload, sort, store, distribute and sell the salvaged materials. Even the smallest retail salvage business must employ three people. And one additional person is needed for every \$150,000 over \$400,000 in annual sales, not including employees in administration and accounting.

Community. Retail organizations selling salvaged materials at thrift-store prices positively impact budget minded families. The more a family can save on home maintenance or improvement, the more income is available for daily necessities, education and savings. The 21 semi-truckloads of materials salvaged from the Matrix Reloaded and Matrix Revolution movie sets were delivered to low-income families in northern Mexico, earning Warner Brothers an international humanitarian award.

The Path from Source to Reuse

In order to determine whether a plan, idea or ordinance is working, the three byproducts of deconstruction — reusable materials, recycled materials and waste — must be measured. The total weight of these byproducts should be reconcilable with project estimates and totals.

Following are summaries of the steps, participants and challenges associated with deconstruction and, ultimately, reuse.

Reuse Survey. To determine which parts of a structure are to be reused, a thorough review or survey of the project must be completed. It should include a written report on the types and quantities of materials to be salvaged, along with photographs. This step should not be assigned to the building owner, deconstruction contractor, construction manager or appraiser, because these parties are neither independent of the transaction nor primarily responsible for distribution

DESIGNING AND IMPLEMENTING A DECONSTRUCTION ORDINANCE

of the materials within the reuse market. An ideal choice would be a city or county employee, trained by a reuse specialist, or the knowledgeable employee of a major reseller/distributor.

Deconstruction. Deconstruction will not automatically keep reusable materials out of landfills or recycling centers. The ultimate goal of this type of ordinance is not deconstruction itself, but reuse. Unless individuals and organizations are available to receive, use, sell or distribute all of the materials salvaged, the ordinance will fail. Consequently, understanding deconstruction, and what deconstruction can and cannot accomplish, is critical to formulating an ordinance.

Deconstruction has several variations. Some buildings are completely deconstructed. Others undergo limited changes, such as a kitchen remodel or complete window replacement. Still other buildings are completely remodeled, with all the interior and exterior walls, ceilings and floors stripped of their finished coverings, leaving only the wood frame. Each of these variations yields reusable materials. Most municipalities charge lower fees for, and more quickly approve, remodeling projects. Perhaps for that reason, since the recession, substantially more permits have been issued for remodeling than for full deconstruction and rebuilding. Materials from remodels are just as bulky and often weigh more than the lumber obtained from full deconstruction. In fact, per cubic yard, the lumber from a project typically weighs less than any other single category of salvaged materials.

Like trucking, deconstruction is one of many vital tools on the path to reuse. But without places to unload, store, sell or distribute the salvaged building materials, deconstruction merely produces an above-ground landfill. Salvaged materials must go to large local facilities in order to be properly distributed. Some materials might be reused in the remodel or replacement structure, or donated, or sold directly from the jobsite. Or even packaged and shipped to an online buyer. However, some materials will always be left over. What happens to them?

Deconstruction Contractors. Three types of contractors are considered likely candidates for deconstruction work. First is the demolition contractor. Simply put, demolition contractors are in the business of making buildings disappear. How they do that is the problem. Demolition contractors have sizeable investments in heavy equipment and need to keep that equipment working to justify the cost. Consequently, most are prone to demolish more materials than they save.

Another likely candidate is the general building contractor. Since general contractors know how to put buildings together, it follows that they should know how to take them apart.

The third likely candidate is the remodeling contractor, a professional who clearly understands how to remove existing materials.

General building and remodeling contractors typically run highly skilled crews whose pay scales range from \$30 to \$40 per hour versus the \$16 to \$20 usually paid to deconstruction workers. The higher rates may be prohibitive as compensation for the removal of such things as roofing shingles, drywall, plaster, stucco, flooring and lumber, or for de-nailing lumber, carting out debris and loading trucks.

Many contractors can easily remove a door, window, rafter, joist or stud. The critical step—the one that is less well known—is how to handle the material following removal. Allowing a

DESIGNING AND IMPLEMENTING A DECONSTRUCTION ORDINANCE

window to be damaged during transport is a waste of both the product and the time and money expended to extract it. Specific procedures are needed to maintain the integrity of materials. For example: windows are removed intact, with the sash securely attached to the frame; exposed nails and screws are removed from cabinetry; lumber and wood materials are de-nailed, separated by size, stacked and unitized with steel bands. Items such as appliances, palletized bricks, cabinets and bookcases are shrink wrapped for protection.

Deconstruction workers and their supervisors/managers must be trained in the principles and skills of building-materials salvage, whether they are experienced construction workers or newcomers. Some deconstruction training may be accomplished in the classroom, but the real proof of salvage competency is whether the agreed upon materials are consistently delivered to the recipient with minimal damage.

Throughout the country there are deconstruction contractors who purport to deconstruct the standard size house in just three days. They do this by either 1) salvaging only the fixtures, rafters and ceiling joists, while destroying the rest of the framing, or 2) salvaging only a few fixtures and cutting the building walls into panels, which they rely on the retailer or laydown yard to dismantle, de-nail and sort, a process that causes more waste than standard deconstruction.

Preparing or adopting written specifications or guidelines on how to handle, protect and ship reusable materials would help ensure high levels of salvage and reuse and give all deconstruction contractors comparable competitive standing.

Recipients. There are only a few choices as to the disposition of reclaimed materials.

- Building owners may retain specific components for inclusion in the new structure.
- Some of the materials may be sold from the jobsite (although the contractor and owner face serious liability issues by allowing the public on an active jobsite).
- Lumber is occasionally delivered to re-milling enterprises or custom furniture makers.
- A few online brokers of used building materials may list offerings.
- The majority of materials typically go to one or more local organizations for resale and distribution to the public.

As discussed in the section “Reuse Survey,” there are always questions about which materials are reusable and which are not. If salvage and reuse decisions are left up to the deconstruction contractor, the lumber or wood re-manufacturer, or the architectural salvage company, many materials for which there are markets will not be salvaged. Conversely, if left up to the owner, the owner’s representative or an appraiser, materials will be identified for which there are no markets.

As the largest purveyors of deconstructed and salvaged materials, reuse retailers are key players in the industry. While some of the largest in the business are nonprofit, many are for-profit. However, for-profit retailers tend to be narrowly focused, offering specific materials, such as old lumber and architecturally significant items like claw-foot bathtubs, stained-glass windows and antique appliances. In contrast, nonprofit retailers typically accept and sell the full range of used

DESIGNING AND IMPLEMENTING A DECONSTRUCTION ORDINANCE

building materials. Delivering to at least one such retailer will help guarantee significant waste reduction.

When materials are left over from jobsite sales, one solution is to move them to retail stores or smaller warehouses. However, this may result in serious price devaluations. Stores with a larger mix of high, medium and low-priced products typically sell more low-priced materials than stores handling only the low-priced goods, for two reasons: 1) more potential buyers shop at stores featuring a wide price range of products than stores with a restricted range, and 2) profit margins on higher-priced items will “carry” the lower-priced and lower-margin items. Additionally, greater margin materials can sustain a low turnover, while low-priced materials need to turn over more quickly.

While some resellers accept lumber with nails, most do not. A great deal of space and labor is required to operate de-nailing stations, and in much of the country de-nailing must be done indoors due to weather conditions. Added space means that more money must be allocated to occupancy costs, causing resellers to limit the space they occupy, which limits the quantity of materials they can accept. Additionally, increasing total labor costs generally leads to higher prices. In contrast, lumber that is de-nailed and unitized on the jobsite is more quickly and safely unloaded at the reseller’s yard, and unitized lumber can easily be stored outside in any weather. Of course, the cost of onsite de-nailing increases the contractor’s total labor costs, which are passed on to the building owner. Costs are costs regardless of where incurred.

Large, sophisticated retailers understand that just because a particular component fails to meet code does not mean it is unusable. For instance, depending on the project, single-glazed wood windows that don’t meet code can still be reused to replace broken windows, or in unconditioned spaces like barns, garages or workshops. They can also be transformed into backdrops for art projects. Still, some materials are not easily reusable, such as older and less efficient electric appliances, broken or damaged materials, and materials that have evidence of rot or insect infestation.

As more building owners demand the deconstruction alternative, and municipalities become more aggressive with ordinances requiring deconstruction, distributors are being pressured to increase their physical size and the scope of their marketing budgets. At the same time, land values in dynamic and growing cities are putting pressure on resellers to downsize their footprint, limit the quantity of materials accepted, or accept only items of higher value. On the West Coast, particularly in San Diego, Los Angeles and the San Francisco Bay Area, this is already a concern that needs to be addressed by policymakers.

Appraisers. Twenty-five years ago, at the birth of deconstruction as a defined method of salvaging reusable building materials, the process for donating reclaimed materials was generally unknown. However, soon donation became a catalyst for encouraging deconstruction, thanks to tax incentives available to private, tax-paying building owners. The majority of owners who could afford to demolish a very livable house (or usable commercial building) in order to build a house more suitable to their lifestyle were in an income bracket that could benefit from commensurate tax deductions.

DESIGNING AND IMPLEMENTING A DECONSTRUCTION ORDINANCE

Unfortunately, it was, and still is, difficult to find appraisers who are qualified to value used building materials. In keeping with current federal and state legislation, the entire appraisal business is broken into three general categories: real estate, personal property and business valuations. An appraiser qualified in one is not necessarily qualified in another. A house sitting on a foundation and firmly attached to the ground is considered, along with the underlying ground, to be real estate. However, once the parts have been disconnected from the building and, consequently, the dirt, the parts are considered personal property.

Created by Congress, the Appraisal Foundation was chartered to create appraisal standards for both real and personal property. To that end, the foundation developed the Uniform Standards of Professional Appraisal Practices (USPAP).

“USPAP was adopted by Congress in 1989, and contains standards for all types of appraisal services, including real estate, personal property, business and mass appraisal. ... USPAP is updated every two years so that appraisers have the information they need to deliver unbiased and thoughtful opinions of value.” (appraisalfoundation.org)

Unlike real property appraisers, personal property appraisers are not licensed by any government, so qualifying them is especially important. The Appraisal Foundation suggests selecting an appraiser from one of its six sponsors: American Society of Appraisers, American Society of Farm Managers and Rural Appraisers, Appraisers Association of America, International Association of Assessing Officers, International Society of Appraisers and the Royal Institution of Chartered Surveyors.

Personal property appraisers, as members of one of these sponsoring organizations, must have the following qualifications:

- 120 hours of education in their specialty and 30 semester credit hours from an accredited college or an Associate’s degree in any field.
- 70 hours every 5 years to include: 20 hours of coursework in valuation theory and the *15-hour Personal Property USPAP Course* or the *7-hour Personal Property USPAP Update Course* once every two years
- 700 hours of general experience
- 1,800 hours in personal property experience of which 900 hours are in their specialty, or
- 4,500 hours of market-related personal property non-appraisal experience in the area of specialization, or
- A combination of both appraisal and non-appraisal experience in the area of specialization at the ratio of 1 year to 2.5 years.

Since there is no license to be revoked, errant appraisers can only be disciplined by removal from their sponsoring association (which is a liability issue for the association) or fines levied by the Internal Revenue Service through the audit process. The IRS clearly takes into consideration the federal stature of USPAP and how appraisers are qualified; however, only one-half of one percent (0.5%) of personal tax returns are audited, with 74.8 percent of those handled through correspondence.

A lack of competition has enabled building-materials appraisers to charge higher rates than are charged by more common and competitive real-estate appraisers. In addition, appraisal fees for

DESIGNING AND IMPLEMENTING A DECONSTRUCTION ORDINANCE

tax-deduction purposes are themselves tax-deductible. These factors have led unscrupulous and unqualified appraisers to seek the more lucrative building-materials appraisal jobs by promising donors unreasonably high valuations and excessively reduced taxes for their donations.

Since donations to nonprofits are often made based on reputation, or referral from a trusted source, audits that go against the donor and the appraiser's valuation can be devastating to the long-term health of a charity whose very existence depends upon such donations.

Verification

To determine which materials are reusable, a reliable organization must survey the project and meet with the architect, building contractor and/or owner to determine the scope of deconstruction and identify the materials to be salvaged for reuse. These include both items designated for reuse in the new project and items to be removed from the site and delivered to other reusers or distributors. Upon completion of the project, the final figures can then be compared with those of the reuse survey, ensuring that all parties (deconstruction contractor, waste hauler, recycler, upcycler and distributor) are in compliance, and the objective of the ordinance has been achieved.

Regardless of where and how the materials wind up being reused, an inventory-tracking system must verify that the materials listed for reuse in the survey are actually salvaged. The system must answer several questions: Who is tracking the materials reused in the owner's new project? Which materials were sold or given away from the jobsite, and who managed that activity? Which materials were delivered elsewhere, and who signed off on the bill of lading?

In addition to line-item inventories, weight tags obtained from each of the recipients, including recyclers, disposal stations and estimated weights from onsite sales, must balance with the estimated total project weight.

On the surface, these final steps may appear onerous and overly detailed. However, most municipalities and practitioners know of contractors who, because of cost or time overruns on a project, have sent materials to the landfill that were scheduled for reuse. Or contractors who have diverted waste to unapproved transfer stations or landfills in order to keep the project's waste numbers low. Or resellers (both nonprofit and for profit) who have disposed of materials that were received for reuse. Or appraisers who have signed appraisals verifying IRS tax deductions, knowing that fewer materials were donated than originally planned.

There are several organizations around the country that purport to accept a wide range of reusable materials, but upon scrutiny have been found to refuse many common materials, or to accept them on an inconsistent basis. This creates a problem for the deconstruction contractor who delivers materials to such an organization one week and has similar materials refused the following week because the facility is "full." Worse still are nonprofit organizations that sign off on all materials received and immediately send those they do not want to landfills.

Recipient certification, or licensing of some type, could solve many of these difficulties. As with certified waste haulers and disposal stations, building owners would know exactly who to contact to arrange delivery of their materials.

DESIGNING AND IMPLEMENTING A DECONSTRUCTION ORDINANCE

A useful certification requirement would stipulate that when recipients could not accommodate donated materials for one reason or another, they would refer the owner or deconstruction contractor to another facility for materials still in need of a home.

Nonprofits are in the best position to qualify appraisers for two reasons. First, the IRS has taken the position that nonprofits may refuse any donation if they believe that the appraised value is too high or that the appraiser is not qualified. Second, the IRS may hold nonprofits accountable for knowingly accepting donations that are overvalued or assessed by an unqualified appraiser. (This problem has been the subject of congressional hearings, and a few state attorneys general have considered imposing sanctions on charities that accept overvalued donations.) To discourage such practices, certification provisions for nonprofit organizations could also stipulate that donations be valued by IRS-qualified appraisers only.

If nonprofits did the work of qualifying appraisers, municipalities would not have to shoulder that responsibility. However, guidelines would have to be written and nonprofits required to abide by them, as a condition of certification.

Summary

A deconstruction ordinance can have significant benefits for the environment, the community, homeowners and enterprising contractors, provided it is knowledgeably designed and wisely executed. Thorough planning needn't take excessive amounts of time or resources, but does call for the guidance of experienced individuals or organizations.

The most important factors in getting reusable building materials from their deconstruction source to the end reuser are logistical. To ensure an owner or contractor's full compliance with the deconstruction ordinance ...

1. Salvage surveys must be taken prior to deconstruction.
2. The operation must be conducted by qualified deconstruction contractors who know how to extract and, more importantly, properly handle and deliver salvaged materials.
3. Salvaged materials must be delivered to qualified recipients who cooperate with other available recipients to ensure that all materials are placed.
4. Inventories, bills of lading and weight receipts must be required.
5. Responsibility for vetting appraisers must be shouldered by knowledgeable individuals, preferably qualified nonprofits.

Deconstruction is doable when done right.

The statements, findings conclusions, and recommendations expressed herein are solely those of the author, and do not necessarily reflect the views of Michigan State University.