

Re-Application of Wood in Landscaping Architecture and Elements Impacting the Reprocessing of Wood Left-Over

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Abstract:

Within landscaping and its field of architecture, re-applying wood has been a useful way to decrease humans' carbon footprint on the environment while providing us with other financial and educational opportunities. In this respect, experts are faced with both technical and moral duties when it comes to common landscaping habits. With this background, the present research looks into the re-application of wood in landscaping and the elements that may influence the possibility of reprocessing wood left-over.

Keywords: -landscaping, re-application, wood, architecture.

THE ISSUE OF LEFT-OVER

A quick glimpse upon any garbage can on the corner of any street or workshop can give us an idea as to the extent of left-over from wood work that can otherwise be applied elsewhere or re-processed. The causes for such waste are mainly about time and deporting limitations. Yet, one should ask if there are other more widespread reasons behind wood being buried in junkyards in such scales rather than being put to good use.

Let us not forget that wood is common in American industries and according to the Environmental Protection Agency's statistics, almost 250,000 houses are razed down in the United States alone annually [1]. According to studies as far back as 2002, the Forest Products Laboratory (FPL) estimates that only %30 of the wood left over has been re-cycled [2]. There are other options instead of bringing down structures, such as deconstruction, materials reuse and recycling, all of which can put to good use the

wood material that might end up in junkyards. Despite this fact, certain factors prevent the ever-growing building sector from doing so and architectures from continuously using such recycled material in their work. For the past hundred years or so, people have grown accustomed to consumption due to the abundance of disposable material, which has eventually led to piling of waste on the planet. Today, we do not regard waste as a precious material, but an extra responsibility to be taken. Landscapers and designers continue to play a part in offering remedies for environmental issues associated with their craft. This said, reversing the negative effect of left-over piling up requires major changes within architectural approaches and the building sector. This can also include a total transformation of old habits of addressing waste and construction material and adopting a "birth to death" vision for their lifecycle. With the latest move in the green construction sector, experts are even more aware

of the origins and lifespans of any material in use. We now know very well that making and disposing any produce can have major impacts on our surroundings emerging as extreme pollution and deterioration of our environment [3, 4]. To regard building practices in view of the environment and preventing material waste down the line are two new and important topics in terms of maintaining green construction. Today, experts in the field are without doubt more in line with such objectives, though whether they are doing what it actually takes is another question. Numerous studies have been carried out in landscaping and design – for example, by Meg Calkins and Kim Sorvig who proposed recycling material and its use in construction [5,8,4]. Nonetheless this practice is among the least favoured within LEED and, in the meantime, old habits of architecture and building have proved not successful in majority applying reclaimed material even though we know a lot more about the topic today [9]. Rough estimates still tell us about the likelihood of C&D – or construction and demolition – material to end up in landfills anyway. As one goes south and west in the United States, the cost for removing municipal solid waste (MSW) and C&D sites remain only \$25 per ton, with landfills still regarded as most favourable in managing waste [10]. Despite noteworthy developments in re-application and reclamations of the beginning of the 90s, merely %10-%20 of all the waste is treated each year, and that comprises mostly metal and concrete [11]. Still, the re-application of, specially wood, products is a massive source in landscaping for making meaningful, economical, and eye-catching designs and, at the same time, a step toward preserving the ecology and green principles while constructing.

Wood Reuse in Design

Apart from the many different materials proposed and employed by landscapists and designers within projects, wood remains as the one material applied globally and throughout history ever since records

exist and genuinely regarded as re-usable thanks to a minimum environmental impact and reduced energy within - as compared to others taken from mines such as metals, rocks or cement material [12]. In the United States, wood remains largely favored and relied upon due to its workability, economy, and abundance – obviously, though on the condition of responsible and measured harvesting. Bearing in mind that roughly %50 of all wood felled from forests finds its way into buildings, one cannot overstate the many effects it can have on the environment [12]. Unlike its numerous advantages, wood stands out in certain ways within any environment; having a limited lifetime, it is subject to many dire impacts due to the weather, namely rotting, infesting, and contact to the solar ultra violet rays [13]. With its low embodied energy in comparison to other substances, any life cycle analysis (LCA) on wood can turn out with discouraging results given maintenance factors for extended periods of time like added care in its use, longevity, finish jobs, up keeping, and exact use of the material [14]. Wood waste, which has so far remained broadly unutilized, has the same features as a stated previously lest minor differences: whether taken from natural or reclaimed sources and locations such as building spots, it is older-growth, more compact, and often of higher quality compared to freshly cut wood, minus the disadvantage of environmental impacts like CO2 emission caused by landfill practices and exploitation of nature [4]. The reason for recycled wood's unpopularity in the United States lends itself to issues with transportation, safety and the law. According to state regulations, for construction, a grade seal is needed for any building material with wood [15] and, despite having such a seal from earlier times, reclaimed wood should still undergo re-assessments by those certified by the American Lumber Standard Committee (ALSC) for further updating, which can prove painstaking as concerns the recycling sector. yet, this is an important factor as users may not necessarily be aware of the amount of stress any given re-used wood can undergo in time. In 1999, a surprising research by the Forest Products Laboratory (FPL) revealed that holes made with nails and damage

caused most of the drop in grade in re-used wood [16] – that is to say, removing bad parts helps to improve the status of wood and improve its durability. Another challenge in case of reused wood is purchasing and access within the market. Efforts to disassemble and pick through the remains can take long and be arduous, making it expensive to perform and, hence, more so for buyers. The degree of access for customers plays a large role in, for instance, how much material is required to complete a certain project [6,8]. For this reason, architects are faced with the question of the right choice of material and its use to be as easy and feasible as possible. Re-applying wood in open areas for building purposes can have environmental and financial gains and, apart from that, complement the design efforts and give a location a sense of history, culture and belonging [7].

In what follows, we take a more detailed look at the wood/inorganic-bonded materials and elements that influence the possibility of reclaimed wood.

Wood/Inorganic-Bonded Products

Processed wood residues and fibers bond by inorganic mediums like Portland cement or gypsum create materials applicable in numerous ways and are highly fire- and infestation-proof against the elements. Such materials have been part of the buildings for many years now in places like Europe, Australia, and Japan, with the United States just beginning to fully appreciate their benefits. As commonly known, virgin fiber used to be the material of choice in such composites; though one producer in the US, Midwest Faswall, Inc., Ottumwa, Iowa, has now combined reclaimed wood from pallets with cement to make long-lasting wall segments for buildings. In Australia, James Hardie, Inc., a major producer, has also put a lot of money into American-based sites to make high-density wood fiber /cement panels and roofing. All of these examples tell us of the high possibility for wood reclaims to be used in construction [17].

ELEMENTS IMPACTING RECLAIMED WOOD POTENTIAL USE:

Whereas there is an abundance of reclaimable wood at hand and endless possibilities for its application in different places, this benefit is highly overshadowed by certain elements such as listed below.

Contamination

One of the causes for such high levels of preliminary wood waste being useable – up to 95% – is its even and pure quality; in turn, the main cause for low usage of other material derived from, say MSW and C&D is simply impurity as demolition processes involve a lot of dirt whose reprocessing according to a site in Massachusetts – to provide an example – has reported only %15 to be reclaimable for mulch material.

Purity is utmost in all cases of material made from wood left-over because resistance is low toward contaminants in case of highly-priced products like MDF and particleboard. Too much surprise, according to estimates, one Styrofoam coffee cup in a shipment of wood chips heading to an MDF site can easily contaminate all pallets made from that same load. In the same way, lowly-priced works like boiler fuels, mulch, and animal beddings do have a certain degree of resistance to degradation and certain paints – mainly lead-based – preservatives, metal, and some foreign substances may not be easily resisted [17].

Cost-Effectiveness and Marketing Risks

There are some issues that affect cost-effectiveness in reclaiming wood, namely the intended end-product, proximity to sources, and sorting/cleaning processes. Above all, the reclaimed goods have to be feasible in marketing terms as opposed to other options. To provide an illustration for such market-related factors, one may refer to the experience of Willamette Industries [3], the company has taken a leading role in reclaiming wood in cities and, upon taking over the Eugene, Oreg., Particleboard Plant in 1991, it experienced lack of reclaimed material. Worsening costs and short supply of common material to make boards,

forced the company to seek out new sources to maintain operations as usual. To this end, from 1993 to 1995 it made use of more than 100,000 tons of dry city wood waste instead and despite the excessive fiber demand in 1995, it leveled out by the year after and forced the prices down significantly for any kind of fiber, resulting in no further interest in reclaimed wood from cities. In 1996, the price for such material as sawdust, planer shavings, and others declined as low as %50 of the former figures. Consequently, the company halted its trading with 10 of the 12 suppliers. Despite heftier costs paid to the two last suppliers against reclaimed wood as opposed to the then prices of the market, Willamette decided to continue working with them [17].

Alternative Resources

Given the many sources supplying reclaimed wood, factors such as quality, particle dimensions, types, wetness, and contamination also change greatly, thereby calling for further and complicated procedures to determine end-product properties.

element in itself economically as the longer it takes, the more the expenses. For this reason, other options can be considered to come up with purer wood and improved material that is valued. Better separation, for instance, on building sites can help reduce exposure to negative elements, simply by putting wood and packaging material in different containers. in order to make this process easier, the National Association of Home Builders Research Centre recently produced its guidelines for residential building waste management [4]. In the end, improved sorting of MSW and C&D waste can also yield improved and finer reclaims.

Scattered Resource Locations

Reclaimable wood is anywhere one looks and, considering the logistics and the associated expenditure being hefty when compared to the cargo's value, at present it is only economical to set up plants where the sources are – and that means mostly in and around cities [17]. As a matter of fact, recyclers themselves are more keen on places where

these resources are used more. mainly solid-fuel boiler operations, and places with better wages for collection are offered and motivate more recycling.

Tackling the Issues

Obviously, countless technical and financial issues are to be faced, though all lead to reclaimed wood playing a pronounced role in making different wood-based products. There are two aspects of this process to take into account: first, making foundations to offer a pure and non-stop flow of waste wood; and second, coming up with explanations and standards for material to help producers and suppliers in more even and persistent business transactions [17]. Once proper action is taken in these two fields, reclaimed wood will turn into a material of choice for the production of unlimited items as demand calls for.

Conclusion

the present research looks into the re-application of wood in landscaping and the elements that may influence the possibility of reprocessing wood left-over. The benefit was highly overshadowed by certain elements such as listed above.

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