salvagemontage

a journey into the discarded world

by

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Author’s Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

This thesis proposes a reinterpretation of assumptions towards material value. It is a positive argument in favour of adaptive re-use, not only as a means to divert waste but also as encouragement to reconsider our current habits of consumption. This paper promotes a discussion of our current environmental predicament rather then a one-sided statement and acts as a guide to re-evaluate our sense of value.

This dissertation puts forward design solutions and alternatives to certain materials that are part of our everyday lives. The design projects herein adapt existing objects into ordinary household items, as an intended gesture of nostalgia toward the object's previous form, while at the same time, taking on a raw elegance of aesthetic quality: the projects are raw in their material origins and elegant in their form and function.

This work is intended to evolve into an ongoing discussion of salvaged material as a response to problems of consumption and waste, as well as to highlight an ongoing process of design.

abstract

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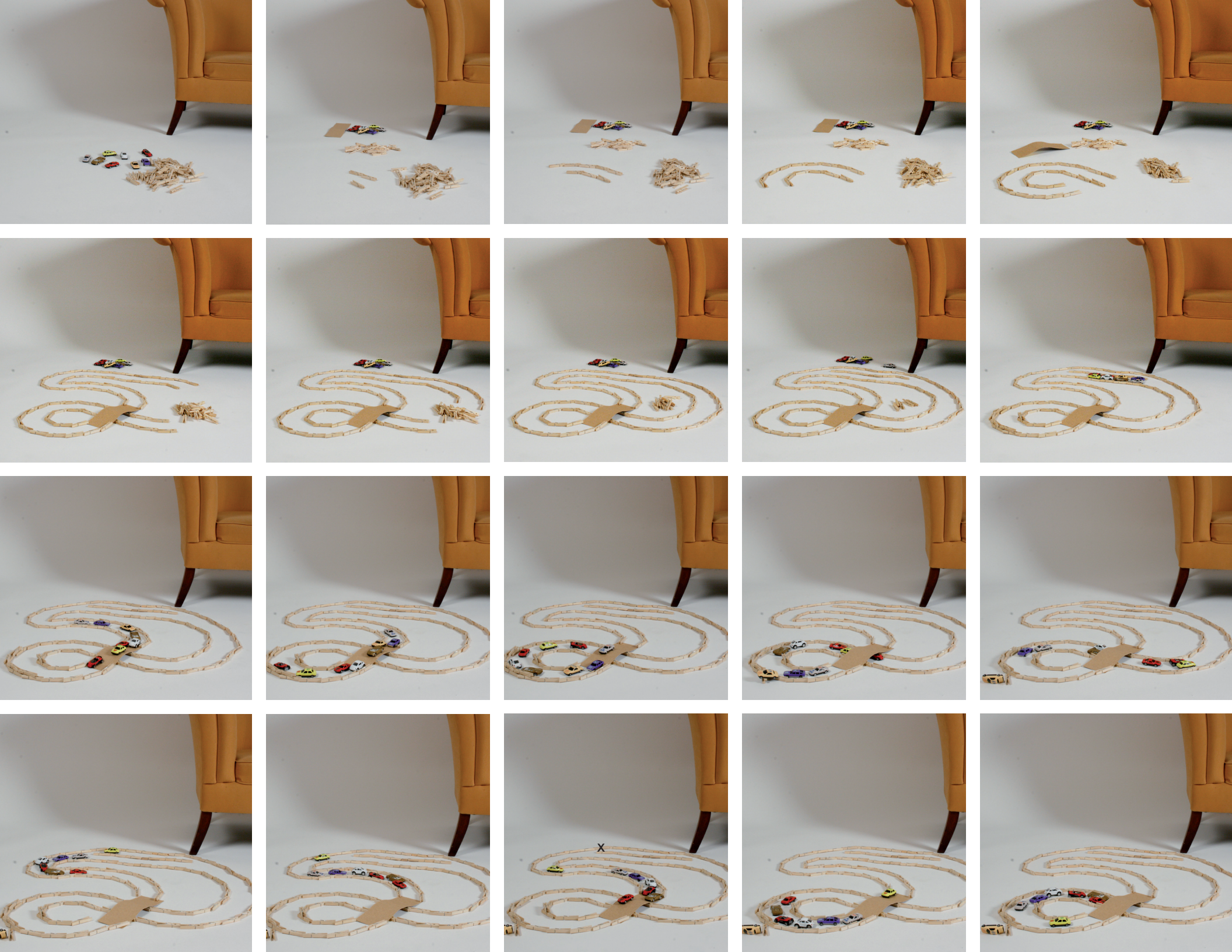
This is a story of innovation and a reinterpretation of our reality...

A little girl is sitting on the floor in the living room of her third floor apartment playing with her brother's miniature race cars. She gets up and runs to the balcony to get a basket of clothespins. She begins to line the clothespins end to end to make loops and spirals on the floor. Eventually, the swirls of clothespins start to resemble a racetrack that is perfectly sized for the little race cars. She lines up the cars, side by side, on one end of the track and the race begins. Get ready, get set, GO!

0.0 | Plastic Chandelier, detail [previous page]

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As the little girl grows older, her world becomes larger and larger with the knowledge that she consumes and the travels she embarks on. Her world no longer only consists of her living room or apartment. It takes her on voyages to the sea and journeys through the mountains. It includes her family, her friends, and her neighbours. It takes her across a deep blue ocean to a new world seemingly filled with wondrous possibilities. She progressively realizes that there is a multitude of people and places in the world, each one with its own ideals, treasures and obstacles. But the world is not simply made of people or places; it is also made of the earth and the sky. It is made of the curious caterpillar on the ground and the majestic birds that fly through the air. It is made up of the trees that shade and shelter her; the flowers that make her smile and the sun that rejuvenates her each morning. The world is made up of all of the creatures on it and everything in between, each entity being connected to the other in an intricate balance of give and take.

In Ersilia, to establish the relationships that sustain the city's life, the inhabitants stretch stings from the corners of the houses, white or black or gray or black-and-white according to whether they mark a relationship of blood, of trade, authority, agency. When the strings become so numerous that you can no longer pass among them, the inhabitants leave: the houses are dismantled; only the strings and their supports remain.

ITALIO CALVINO

When one tugs at a single thing in nature one finds it attached to the rest of the world.

JOHN MUIR

introduction

This is a story of innovation and a reinterpretation of what is perceived to be true in terms of material value and form. The little girl wanted a racetrack but did not have the resources for one. She thus fashioned one with her imagination and the materials that were readily available to her. This type of experience became frequent throughout her life, fashioning items from her surroundings or scavenger hunts through her father's collection of miscellaneous items in the garage. She did not see a piece of garbage as something to discard. She saw these things for the value they encompass and for their potential. They were once a valuable resource that had been collected and carefully toiled over. They embodied a certain amount of energy, craft and design in order to create them. She could perceive its beauty and visualize its potential to become something new. The girl, now being a little less little, goes through a metamorphosis that has moulded the way she understands the material world around her. This is how it happened. These are the questions she posed of the world and the topics that have affected the way she perceives her surroundings.

The relationship between resilience and design is mediated by innovation. Innovation permits the discovery of a process that enables adaptation and offers the ability to reconceptualize with design. With these tools in hand, an approach to becoming resilient can be achieved. This theory is tested in this design thesis through the transformative act of taking objects that have already been constructed or serve a function and deterritorializing them from their current form. This hypothesis functions on the principle that it is imperative to understand an object through experimentation and play in order to see beyond its prescribed use and the social prejudices of its perceived value. This is a design approach that is meant be used regardless of an existing environmental predicament.

However, a predicament does currently exist. Our westernized, capitalistic society has created a situation in which we have a multitude of existing production that has limited the raw material resources available. As a result, alternative methods of sourcing building material are required. The approach of this proposal aims to discover building material in the most unlikely places.

The information and statements included in this disertation are intentionally kept within the realm of design and relate primarily to our Western North American culture, unless otherwise stated. They also acknowledge the contradiction and exception that we all know exists alongside the majority.

0.3 | Trash is Beautiful [opposite page]
Work inspired by Susana Reisman's Photography: Plastikos. Trash. 2007. p. 272

In North America only 1% of all products bought remain in-use six months after their purchase.[1] That is not a long life span, but more importantly, that means there are a lot of products that end up in landfill sites. All design has a limited life span but the materials with which they are made do not disappear once discarded. Their mass must go somewhere. One approach would be to give the materials an extended life span by designing materials that would serve as "technical nutrients" that can be re-introduced into another production process. Where ever possible, materials could also be made into biological "nourishment" —providing nutrients for the earth as they biodegrade. In both cases the design of the materials is being reinterpreted and the potential future of a substance would be acknowledged by the initial design. For the purposes of this design thesis, the focus will be on finding a potential future for an object and not to create new building materials.

From another perspective, there is much thought and design that has already gone into all objects, making them attractive, in and of themselves. It is not an easy feat to create the plastic moulds that will precisely fit around a product, yet these are viewed as some sort of foreign object when it has no further use. In essence,

1| Paul Hawken, Natural Capitalism, (1999) p. 81. (In the "The Story of Stuff")


trash is beautiful

this "Cradle to Cradle"[2] approach gives the piece of packaging a new purpose and therefore value. The streets are often littered with take-out containers or other food packaging. What if littering became valuable nourishment to the planet by creating containers that consist of biodegradable material that adds nutrients to the soil as it decomposes. It will, however, take our Western culture time to reach a total "Cradle to Cradle" approach to our industrious ways. Regardless, the equation still exists; if an object is given purpose, it will have value in our eyes. Therefore a new design solution lays in the re-interpretation of an object's or material's function or purpose.

This brings to light the question of the value that an object has at any given time. This thesis will explore some facets of what gives an object value, more specifically through the lens of material culture and design. An object's value, or lack thereof, carries through to trash. Trash is the point at which a product or object appears to lose its value and is discarded. Our persistent accumulation of trash is one direct result of our consumerist culture. This dissertation covers some of the factors that drive our consumption, and in turn have contributed to our current environmental predicament. It looks at key events in history that have propelled our current environmental state. It further investigates our notions of sustainability and defines this term for the purpose of the design projects. The topics explored are key motivations for the design approach. They are outlined for the purpose of having a better understanding of the conditions in which design manifests itself in today's world — and that of the little girl at the beginning of this story.

2| Conceived by William McDonough and Micheal Braungart, the Cradle to Cradle approach challenges the belief that human industry must damage the natural world. It urges to use nature itself as our model for our productivity. Using the idea that waste equals food as a guiding principle to designing products from the onset so that they can provide nourishment for something new.
,William McDonough and Michael Braungart. *Cradle to Cradle*. (New York: North Point Press) 2002.

PART ONE

INVESTIGATION

What in our material culture dictates the functions and purpose of an object or material? What is it that gives something value? Is it merely the fact that it has a function or a purpose? Material itself has value. Design has value. Craft has the ability to bring value to an object. Durability contains value.

What keeps us from seeing the potential that is encompassed by an object?

> "Materials flow through a system, which is made up of materials, energy, and the natural environment and is governed by man-made institutions such as production, consumption, technology, transportations, and government."[1]

This thesis investigates material culture as it is broadly defined according to Tim Dant and the way in which consumption and production of goods takes place within and contributes to culture. It focuses on the value and volume of material.

This is an exploration of the aesthetic, symbolic and experiential dimensions of consumer goods through the design and experimentation of the different pieces. It is a query into our present day consumer culture. For the purpose of this work, I will define the terms "material" and "culture" using a definition from Tim Dant, calling material, "that which we can see, touch and smell but which is not human or animal"[2] , and culture as "the set of common human practices that surround material objects – the ways of using material, of sharing it, of talking about it, of naming it and of making it. This culture is, however, dynamic and variable such that individual responses will adapt and alter those common practices."[3]

The relationship between material culture and the social world are evaluated throughout this thesis. It therefore attempts to further comprehend our current situation and develop a better understanding of our consumer culture. For what reason does it seem that people increasingly want to posses more? Materials are increasingly made widely available for use. Technological innovations have afforded us the ability to make new materials and to manufacture new products from them. These new materials have made it possible for more people to have access to products that they would not normally be able to afford. These objects have become an integral part of our every day lives. They have transformed how we execute our domestic routines and redesigned how and who accomplishes certain tasks. Washing machines have afforded us more free time for leisure. Innovative kitchen tools and gadgets allow for even the most inexperienced chef to create a gourmet meal. These materials and objects with which we have surrounded ourselves embody a social agency; they become a means of expression of age, gender, identity and power. Essentially, people choose what they consume based on

1| Kenneth Geiser, Materials Matter, (2001) p.1

2| Tim Dant, Material Culture in the Social World. (1999). p. 11

3| Tim Dant, Material Culture in the Social World. (1999). p. 11

how they want others to perceived them.[4]

Yet, a material's function or its potential is often limited by our programmed social prejudices towards a specific object and its form. For example, ceramic is usually associated with mugs, vases or dinner ware but it can also be used for washers in plumbing fixture or even on the space shuttle for its resistance to heat and durability.[5] In part, this thesis attempts to push the boundaries on these predetermined associations and presumptions of different materials.

So much value is given to goods on one end of the production process and zero value to it once it has been disposed of, after its initial intended use has expired.

Goods become more valuable than people during the extraction, production, distribution, and consumption stages of our industrial system.[6] When it comes to the disposal stage, however, the goods are suddenly worth very little, or more often nothing at all. In all stages of our industrial system people are taken advantage of. During the extraction and production processes, particularly in the third world, people's homes and surrounding habitats are destroyed or polluted to make way for toxic factories. The mere fact that a person is from a third world country, automatically presumes that he/she essentially has no value because they do not contribute to consumption, nor do they legally own the land they live on regardless of how many generations have previously lived there. Whole communities are affected by being displaced from their homes and forced to work in factories. Even governments are more concerned about looking out for the corporations then for their own people. As the corporations grow in size and power, so does their influence over government. The USA is renowned for this phenomena but evidence of this can be seen internationally.[7]

In the distribution process it becomes more and more evident who is actually paying for the value of the products. It is not the consumer that is capturing the true costs; they simply create the demand. The costs are externalized. The people who are actually paying for the product's value are those of third world countries such as the children from the Congo who pay with their futures by dropping out of school to work in the mine, or the big box store workers in the developed world who are paid with low wages that lack health insurance or benefits. On a social level, the consumer also pays by being permanently labelled as such and not seen as the mother or father or teacher or student that they actually are. When it comes to the disposal stage, the consumed objects are discarded into garbage bins or at best into recycling bins. If they go into the trash, they will most likely be buried in a landfill site never

4| Elizabeth Shove, Matthew Watson, Martin Hand, and Jack Ingram. *The Design of Everyday Life*. (2007)

5| Lefteri, Chris. Materials for Inspirational Design. 2006. p. 6

6| Even though these statements are indebted to Marxist theory, it is not intended as the focus for the purpose of this thesis. The intention here is to make note of the actual conditions that exist within our current globalized industrial model and to comment on the discrepancies of the value system associated with it.

7| Annie Leonard. The Story of Stuff. www.storyofstuff.com. 2005

to be seen again. If recycling is possible, they may still not be of value if there is no demand for such a raw material. In this case objects will be sent to a landfill anyway. It will just take longer to get there.

How can we disregard these objects so easily if so many have paid for them along the way?

In part it is due to a lack of awareness. Most people only see the consumption and disposal stages of this system. Items magically appear on the store shelves and when the object's function has run its course, it is left at the curb side to be mysteriously taken away. This is how our culture has been conditioned to view these materials. Most consumers do not think about the life a product had before it was placed on the retail shelves or who put it together or how far it has travelled to get there. Nor do they think about its life after it is no longer 'useful'. Take an ordinary, small, off-the-shelf radio for instance. The metal needed is mined in South Africa. The petroleum to make the plastic components comes from Iraq. The plastics are made in China where it may be assembled. It is then shipped to North America where it is distributed to many retail outlets so that it can reach the consumer in the most convenient way possible.[8]

How does design play a part in all of this?

This relationship between products and people is what designers focus on. They focus on this to make products marketable, functional, and aesthetically pleasing. Designers are frequently hired to embed tangible and yet mysteriously elusive qualities and emotional values into the products on which they work. Careful understanding of consumer needs – whether based on user research or designer intuition – is crucial in determining design opportunities and in determining how these challenges are met. Seymour Powell suggests that rather than meeting needs, artefacts are actively implicated alongside users in creating new practices, and with them, new patterns of demand, thus viewing users and consumers as designers in their own right. Powell further states that designers add value to products "by manipulating subconscious emotional cues of tactile and material factors and by generating an emotional resonance and visceral appeal of a kind that sets the exquisite apart from the common place"[9] Design then becomes a medium through which social and commercial ambitions are materialized and realized. It does, however, leave one to question whether designers inadvertently, but inevitably, contribute to patterns of unsustainable consumption, or if they provide a necessary service in humanizing technology and increasing welfare by designing for all. For the sake of this thesis I argue for the later, especially when considering our future. According to the UK Design Council in 2004, a successful future depends on innovative design and not on manufacturing. In order to have innovative design, one needs to consider design for all situations in order to accommodate complex environmental, social and cultural needs and circumstances.

Sociologist Tim Dant, again, provides a useful and concise description of how people engage with objects. From a so-

8| Annie Leonard. The Story of Stuff. www.storyofstuff.com. Distribution. 2005

9| Elizabeth Shove, Matthew Watson, Martin Hand, and Jack Ingram. The Design of Everyday Life. 2007

ciological perspective, objects have a physical presence in the world, and thus have material consequences. A world of man-made things that modify the natural world to provide a material environment is the context in which social interaction takes place. Things, both natural and man-made, are appropriated into human culture. They represent the social relations of culture by standing in for other human beings, carrying values, ideas and emotions. It is therefore easy to attach our sense of value to these materials and objects. In anthropology and archaeology material culture provides evidence of the distinctive form of society. It provides this evidence because it is an integral part of what that society is. Just as the individual cannot be understood independently of society, so society cannot be grasped independently of its material stuff. Material culture ties us to others, providing a means of sharing values activities and life styles in a more concrete and enduring way than language use or direct interaction. The things we relate to have embodied within them the social relations that gave rise to them through their design; the work of producing them, their prior use, the intention to communicate through them and their place within an existing cultural system of objects. Dant concludes that material culture is thus an important component of the social world, in that it affects our values, our actions and our lifestyles.[10]

One of the reasons that we seem to find it so easy to discard a material or a product is because our material values are misplaced and have therefore lead us to our current disconnect from the product and the consequences attached to the consumption of it. Every year the world's industrial enterprises pump out a slew of products that enrich our lives, support our health, ease our work, and entertain and amuse us. Yet many of the materials in these products that satisfy us also create risks to our health and the environment. That which we think is making us prosperous and enriching our lives is the same substance that is harming us.

10| Sociological Ideas taken from: Tim Dant. Material Culture in the Social World. 1999

trash + consumerism

The city of Leonia refashions itself every day: every morning the people wake between fresh sheets, wash with just-unwrapped cakes of soap, wear brand-new clothing, take from the latest model refrigerator still unopened tins, listening to the last-minute jingles from the most up-to-date radio.

On the sidewalks, encased in spotless plastic bags, the remains of yesterday's Leonia await the garbage truck. Not only squeezed tubes of toothpaste, blown-out light bulbs, newspapers, containers, wrappings, but also boilers, encyclopedias, pianos, porcelain dinner services. It is not so much by the things that each day are manufactured, sold, bought that you can measure Leonia's opulence, but rather by the things that each day are thrown out to make room for the new. So you begin to wonder if Leonia's true passion is really, as they say, the enjoyment of new and different things, and not, instead, the joy of expelling, discarding, cleansing itself of a recurrent impurity. The fact is that street cleaners are welcomed like angels, and their task of removing the residue of yesterday's existence is surrounded by the respectful silence, like a ritual that inspires devotion, perhaps only because once things have been cast off nobody wants to have to think about them further.

Nobody wonders where, each day, they carry their load of refuse. Outside the city, surely; but each year the city expands, and the street cleaners have to fall farther back. The bulk of the outflow increases and the piles rise higher, become stratified, extend over a wider perimeter. Besides, the more Leonia's talent for making new materials excels, the more the rubbish improves in quality, resists time, the elements, fermentations, and combustions. A fortress of indestructible leftovers surrounds Leonia, dominating it on every side, like a chain of mountains. [11]

Italio Calvino

11| Italio Calvino, Invisible Cities, (1974) . 114.

Where does all the garbage go when they pick it up from the curb? How does it affect us and the environment?

Trash, garbage, rubbish, refuse…all different words to describe what the Canadian government, for one, refers to as Municipal Solid Waste. According to Statistics Canada, waste is defined as "materials that are unwanted by their producer… They might be products whose value has been consumed…"[12]
The first statement is referring to industrial waste and the latter is referring to consumer waste.

What is exactly meant by value that has been consumed? The material doesn't just disappear into thin air. Is value consumed once an object is no longer needed for its primary function? Or is it considered consumed because it has changed its physical state?

12| Statistics Canada, Annual Statistics. *Human Activity and the Environment*. (2005) p. 1

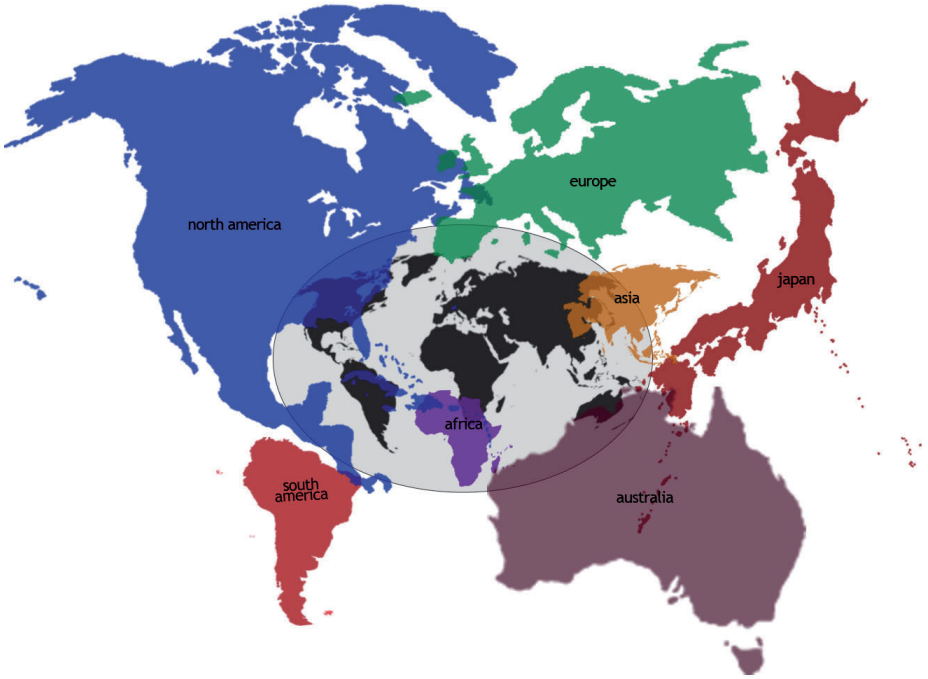
Both conditions can be true. This thesis deals with materials whose value has been consumed but they have not changed their physical state — unlike, for instance fossil fuels or substances used in a chemical reaction. This work deals with the materials, items or products that are left behind or have been discarded. Items such as recyclable containers, used tires, discarded appliances or scrap metals.

To put it into perspective:

When considering all of the solid waste sources, Canada disposes of 2.66Kg of trash per person per day. Household waste takes up 38% of that amount, holding the average Canadian household accountable for 383Kg per capita.[13]
The trash that we produce is only the tip of the iceberg. For every garbage bag we put at the curb there are 70 bags made upstream.[14]

North America, as a whole, produces enough garbage each day to fill 70,000 garbage trucks.[15] Every single inhabitant of the world's industrialized countries consumes an average of 100 metric tones of non-renewable raw materials and more then 500 tonnes of fresh water every year.[16] According to ecological footprint calculations, each person has 1.8 global hectares (gha) of biologically productive

13| Statistics Canada, Annual Statistics. *Human Activity and the Environment*. (2005) p. 2
14| John Young and Aaron Sachs, The Next Efficiency Revolution: Creating a Sustainable Materials Economy, (1994), p. 13
15| www.obviously.ca,"500,000 tonnes of waste coming to an open field near you"
16| Holzer Kobler Architekturen, *All We Need*. (2007) p. 29.



Africa – 1.1gha; Asia and the Pacific Rim – 1.3gha;
Australia - 7.8gha; Japan – 4.4 gha; EU – 4.8gha;
North America – 9.4gha; South America 2.4gha

1.1 | The World's Consumption
Holzer Kobler Architekturen, *All We Need*. (2007) p. 30
A comparison of the average gha from countries around the world. According to the Ecological Footprint analysis the actual amount of biologically productive land available per head of population is 1.8 gha per person. The average ecological footprint worldwide currently stands at 2.2 gha per person.

land actually available to them worldwide.[17] Currently, the average footprint is calculated to be 2.2 gha. Therefore the world is somehow functioning on a 0.4gha deficit per person.

How does this perception of materials relate to our Environmental situation? What makes us consume at such an alarming rate? What factors are driving consumption? Trash… It is all about trash.

According to the Statistics Canada report on Human Activity and the Environment 2005[18] there are many factors that affect waste production. These factors include rising incomes and consumption of more goods, leading to more waste. Studies show that the amount of waste generated often increases along with gross domestic product (GDP).

17| Wackernagel, Mathis and William Rees. *Ecological Footprint*. 1996. p 9. An Ecological Footprint analysis is an accounting tool that enables us to estimate the resource consumption and waste assimilation requirements of a defined human population or economy in terms of a corresponding productive land area. Measured in gha (global hectares).
18| Statitics Canada, Annual Statistics. *Human Activity and the Environment*. (2005) p. 3

The trash produced by our consumerist culture is further stimulated by perceived and planned obsolescence.

Perceived obsolescence occurs on the marketing side of the production process. This is where companies spend tremendous amounts of money trying to convince the consumer that their life is not good enough without their product, that they need a certain product to declare their identity and status in the world, or that their current items have gone out of style. Planned obsolescence is integrated into product design, when products fail after a certain amount of time. This time frame is calculated based on the quality and cost of the product, when the producer would like to have the consumer replace the product, and the time frame that the consumer may feel is lengthy enough to compensate for its monetary value.

These factors are all put in place to contribute to the economy. In order to keep a productive economy within our current economic model, the consumer must keep consuming. After World War II, many countries, such as the United States, needed to encourage their economy to grow. Post-war retail analyst Victor Lebow theorized, "our enormously productive economy…demands that we make consumption our way of life. That we convert the buying and use of goods into a ritual. That we seek our spiritual satisfaction in consumption… we need things consumed, burned up, replaced and discarded at an ever-accelerating rate."[19] In other words, our happiness and spirituality must be fulfilled by our consumption of inanimate objects. In the pursuit of happiness, people are purchasing twice as much stuff as they did fifty years ago, but ironically enough, the national happiness in the US has been consistently declining.[20] This is, in part, to do with the fact the people do not have enough time for the things that truly make them happy such as friends, family, and leisure time. They are working so hard in order to earn the money to buy the items that they desire.[21]

Consumption, at its most economic, also overlooks the importance of relations between material objects in sustaining the flow of social life by concentrating on the selling of goods and the moment of their exchange for money. This establishes that consumer spending is the main force behind economic growth. Another point that must be addressed is how analysts and economists measure prosperity or economic growth. It is today's dominant driving force for our society. They do so by calculating the increase in a country's Gross Domestic Product (GDP). This refers to every increase in the sum of all the products and services generated during the course of a given year.[22] However, this measurement has its flaws. First, it only takes into account economic activity and only if it can be represented in monetary terms. For example, work can only be included if someone was paid for it so that volunteer work, household work, raising children, caring for the elderly, or leisure time are not included. Secondly, both the good and the bad are included in the calculation of the GDP indiscriminately. Therefore, road traffic crashes, oil spills, death through illegal drugs and misuse of medica-

19| Victor Lebow, *Journal of Retailing*, quoted in Durning, How Much is Enough? (1992)

20| Bill McKibben, *Deep Economy* (2007), p.35-36 (reference from The Story of Stuff. www.storyofstuff.com. 2005)

21| Juliet Schor. *The Overworked American: The Unexpected Decline of Leisure (1992).* (reference from The Story of Stuff. www.storyofstuff.com. 2005)

22| Holzer Kobler Architekturen, *All We Need*. (2007) p. 30

tion can also increase the GDP. This brings into question whether this is a value that portrays prosperity or misfortune. Thirdly, the natural environment only appears in the GDP where its resources have a retail value. Trees, for instance, only count if they are chopped down and sold. We need these trees to convert carbon dioxide in the air into oxygen, a process that we cannot live without, and yet they are given no value in their natural state.[23] The point is that our well-being depends to a large extent on these points that the GDP does not account for in any regard. It would seem that this is counter intuitive. It also creates an economic formulate that provides little incentive to select more environmentally friendly options. This is yet another example of how our values seem to be misplaced.

Our current industrial model dictates that comfort and well-being are linked to an increase in consumption, making it near-impossible to move forward sustainably using existing ideas. There is a need to consume less and generate a sense of community. This thesis works on the principle that, as Browner, Mallory and Ohlman state in Experimental Eco-Design, "great systemic changes can happen from radical innovation of local systems."[24] Our world today is in an unsustainable prosperity. The world is not big enough to sustain a population of 6 billion at today's level of consumption. Twenty percent of the world's population consumes eighty percent of its resources.[25] This environmental pressure also creates political tensions. The inequality shows the desperate need for alternative lifestyles and proposals for how to live on this planet. It then becomes a "Catch-22" where companies and politicians say they cannot do anything because people do not want change and the people say they cannot change because politicians and companies do not offer any alternatives. Designers can therefore be blocked inside a dynamic that does not permit them to imagine anything outside of new and useless gadgets or incremental improvements in a system that is unsustainable. In order to step out of this system, we first need to adopt a different representation of reality. The design projects presented in Part Two attempt to do so through the design journeys they embark on and how they challenge material use.

Looking at the culture of spending in the US, it becomes clear that what Americans buy and own is tightly bound to their personal identity. It is not the sole purpose of their spending but Americans do compare their own life style and possessions to those who they want to be like and respect. This is not a new concept. As Juliet Schor notes in Overspent America, this sort of "competitive acquisition" has long been an American institution.[26] Post World War II, it was very common for the average American to use their possessions to make a statement that their careers were not failing. In recent decades the culture of spending has changed and intensified. Before, people typically compared themselves to their neighbour who earned more or less the same wages. Mass media changes this relationship, and people are exposed to products that they would otherwise not be able to afford. For example, a lower income person is regularly exposed to luxury cars and designer clothes through advertisements meant for those

23| Holzer Kobler Architekturen, *All We Need*. (2007) p. 31
24| Cara Brower, Rachel Mallory, Zachary Ohlman. *Experimental Eco-Design*. (SA: Rotovision. 2005.)
25| Cara Brower, Rachel Mallory, Zachary Ohlman. *Experimental Eco-Design*. (SA: Rotovision. 2005.)
26| Juliet B. Schor. *Overspent America: Why we want what we don't need*. (New York: Basic Books. 1998.) p.3

who earn much more. As a result people are now comparing themselves to others whose income is three, four, or even five times their own earnings. This is a new kind of consumerism created by a culture of upscale spending. Another reason for this phenomenon is that a community of co-workers has now replaced the neighbour. While a group of people may all work in the same or a related field, they are more often then not earning very differing salaries. For example, an administrative staff member is in contact with a top executive that earns much higher wages but they are all striving to engage in the same cultural consumption.

In a consumption driven economy, would there be any adverse effects from consuming less? During times of economic decline we see that it has immediate adverse effects such as business closures, layoffs, unemployment and others being forced into part-time work.

There is no simple answer when it comes to dealing with economics. In relation to employment rates, at any point in time, employment depends on production, the number of people who want jobs, and the number of hours they want to work, and the amount of work being offered. If consumption decreases, production will follow the same trend. In this case, depending on how severe of a decrease in cultural consumption, employment can be sustained if fewer people need jobs or the hours are decreased.[27] According to Juliet Schor, this would suggest that a gradual reduction would not cause much unemployment. On the other hand, Schor says that most economists believe that people are currently not saving enough. There is worry that consumer credit has reached unhealthy levels and that it is no surprise that we are currently experiencing a credit collapse at the end of this decade. This leads to underinvesting for the future. Too much saving can also cause problems for the economy because businesses stop investing from lack of demand. This in turn leads to recession and unemployment. To avoid this a balance needs to be established to maintain a healthy economy with less consumption. Any decline in consumption needs to be gradual so that it does not cause an onset to a recession. On the upside, downturns in demand can lead to market diversification, consolidations and efficiency gains.[28]

In the long run having a population largely made up of "postmaterialists,"[29] such as the Netherlands and Denmark, means a slow growth rate. A slow rate can be a perfectly acceptable reflection of people's choices and priorities. In the case of these European countries they value more time off work to spend it living and desire more environmental protection. They also opt for more financial security versus a gotta-have-it now attitude. The down side being that their global competitive position tends to worsen. In

27| Juliet B. Schor. *Overspent America: Why we want what we don't need*. (New York: Basic Books. 1998.) p.170
28| Juliet B. Schor. *Overspent America: Why we want what we don't need*. (New York: Basic Books. 1998.) p.170
29| Juliet B. Schor. *Overspent America: Why we want what we don't need*. (New York: Basic Books. 1998.) p.171

an increasingly global economy, this can be detrimental. However, it can also prove to be a more stable solution since the globalization of consumer markets has proceeded too rapidly with too little thought of its consequences. It would be logical to blame this rapid progress on the inevitable effect of technology but it has, in fact, been perpetuated mostly by deliberate action of companies and governments and not necessarily as a direct result of the economy's natural progression.[30]

How does our perception of Trash influence how it would be re-used?

Colonial blacksmiths regularly made use of old metal when fashioning new goods. They would retrieve the metals from farm implements and cookware then forge it into something new. At the time they recycled to save on the cost of metal.[31] Today we do so to defer some of our solid waste from landfill sites in order to protect the environment.

Re-use of old materials is not a new concept. In the 1700s, mills, factories, shops and homes did so on a day to day basis. The home is where most of this re-use took place: mending old clothes or using them for rags or bits for quilts.

The way in which people perceive waste has shaped their choices in how to manage it. Our current relationship with waste is that we think of it as polluting. In order to stay clean, we must get rid of this waste. As a result there exists the curb side pick-up system. This way of thinking extends to the people charged with handling waste. Waste trade labour has rarely gained respect, despite its importance. It is dirty work and it is done so in unsanitary conditions. This equates to the average person as a low status position with high risk. It is, however, still regarded as honourable and necessary within today's industrial model. There is a stigma attached to waste handlers. Their work by definition occurs on the boundary of what societies deems valuable.[32]

Recycling has become a means to justify the disposability that took hold in the late twentieth century. At this point it is only slowing down the inevitable. If we continue to consume at our present rate, we will eventually run out of resources. Design within the recycling process may alleviate some of the problems inherent in processing scrap materials. Removing toxins or unusable materials from complex manufactured products would reduce the issues of hazardous materials. Engineering solutions are necessary but not sufficient. Cultural changes in the way people from developed countries perceive these objects and who handles them are required to address environmental inequalities. In order to develop sustainable use of resources, the cultural assumptions regarding waste need to be addressed. Part of the solution would be to substantially alter the mass production of complex wastes and alleviate the social inequalities of waste management.

30| Juliet B. Schor. *Overspent America: Why we want what we don't need*. (New York: Basic Books. 1998.) p.172
31| Carl A. Zimring. *Cash for your Trash*. (New Jersey: University Press, . 2005.)
32| Carl A. Zimring. *Cash for your Trash*. (New Jersey: University Press, . 2005.) p.2

Over time we have come to distance ourselves from the consequence of consumption. This has been made possible because of technological progress, political change, and cultural attitudes. This particular environmental predicament that we have with waste has little to do with inefficiency, but rather with a consumptive society unwilling to look at the consequences of its actions and too willing to impose those consequences on a few. We have gone from having a stewardship of objects to engaging in a throwaway society. Having more stuff does not necessarily lead to a better quality of life or overall happiness. Ultimately, we only have 24 hours in a day in which to consume all of the products that we purchase.

The ideals mentioned in this section are warranted and credible but it will take some time to implement them since it takes time for people to change. There is no one solution for the whole world. There are too many variables for this to be true. Each place has its own differing circumstances.

To minimize and hopefully completely alleviate our environmental predicament, the average person will have to rethink their consumption patterns. One can think twice about a purchase or save up for a better, more durable product. People will also have to re-evaluate their ideals of self worth and what truly brings value to one's life. There would have to be a call for innovation to change our global economic structure so that it is more profitable to use less and provide incentives to better our situation. As Saches and Max-Neef state, in Human Scale Development, "beyond a certain threshold, things start to rob us of time. Products have to be chosen, bought, set up, used, experienced, looked after, put away, dusted, repaired, stored and disposed of. Appointments, too, have to be planned, coordinated, discussed, put in the diary, kept, evaluated and followed up.[33]

33| Wolfgang Saches. Manfred Max-Neef, *Human Scale Development*, New York/London, 1991.

environmental predicament

At this point it would be useful to take a look backwards at the events that propelled our current, capitalist-driven, consumer culture that fills our planet with trash and pollution, then theorize on how we can begin to move in a different direction that no longer has pollution or effluence in its formula.

Human history dates back approximately three million years. In the last 10,000 years we have managed to drastically alter the harmonious balance of life. At approximately this time in human history, agriculture was established in the Middle East. That meant that there were some people that no longer needed to be nomadic hunters and gatherers. Agriculture became a plentiful and more reliable source of food that enabled humans to increase their population. This allowed them to settle in one place. It was at this turning point that people felt that they had to protect their land and by default their food source with great vigour thus leading to organized warfare. In time, one begins to see civilization flourish. Complex cities and empires are built along with complex systems of infrastructure and economy. We see them rise and fall time and again. People begin to specialize in their work and in their craft creating demand for specialty items and textiles. At first it was only the wealthy that could afford such luxuries and therefore having little impact on the planet. However, with the birth of the Industrial Revolution these items become mass produced and more readily available to the general populous, in turn accelerating the production of waste and pollutants exponentially; aiding the depletion of natural resources, wildlife and natural habitats.

The currency of the world evolved from the amount of land one owns, to the resources it contained, to the amount of product one could sell. The idea was to make more for less. One was no longer dealing with necessities but desires. To keep people buying things that they didn't need, perceived obsolesce was invented. For example, fashion became a driving force for consumerism. People were led to believe that they had to keep up with the times and wear what was the latest fashion. Planned obsolesce followed lead by new innovative technology and from there it increasingly accelerated with the age of electronics. It became a race to keep up with technology and is then exacerbated by economist campaigns to sustain the economy that one day tells us to save, save, save and the next day turns consumerism into a spiritual experience.

Throughout this time one civilization after another became further and further disconnected from their connection with nature, with the exception of the few remaining tribes in this world. In our race for profit we forgot to carry out the most important duty of all: to insure the survival of our future generations.

We are left with a predicament of limited resources on a finite planet, and a consumer-based culture that isn't going to change in the near future and yet is being harmed by the very toxins and by-products that come from the manufacturing of their beloved products.

It is not easy to simply dismiss 10,000 years of bad habits and relinquish our modern conveniences. Where does one begin to change?

We cannot solve our problems with the same thinking we used when we created them.

ALBERT EINSTEIN

The simple answer is to begin anywhere. The next question becomes how to get enough people to simply begin, that will make enough of a difference? At this point in our environmental predicament, change has become a necessity and not necessarily an option. If there is a way to convince the mass populous to take action or even begin to change their ways of thinking, some kind of a change could happen. But the idea is not to become a dictator on environmentalism nor to guilt people into taking action. The idea is to encourage people to want to reconnect with their home planet, to remember the natural cycles of life and to respect it. Basic psychology suggests that if a person loves something enough, they will do anything to protect it. In theory, this is a method in which people could become more accepting and open to change.

While getting someone to love something is quite an undertaking, it is still the intended pursuit in the hopes of encouraging people to relate to these issues and to reinterpret their habits.

William McDonough and Michael Braungart have devised the "Cradle to Cradle" design methodology that begins to pave the way to more resilient solutions. They have termed it "eco-effective thinking."[34] The basis of eco-effective thinking comes from the reuse of industrial materials and the reuse of existing buildings. This is shown in one of their projects, the original Ford Dearborn, Michigan plant renovation. The owner decided to take on the responsibility of dealing with the partially-brown field site on which the plant was located. The company wanted to go beyond recycling and efficiency. McDonough and Michael implemented strategies such as a green roof and a porous parking lot to absorb and store water for storm water management. The water then seeps into the construction marshes where it is purified naturally by the existing ecosystem. Therefore, instead of spending $48 million to install concrete pipes for storm water management, they saved as much as $35 million on an eco-effective approach that cleans the water and air, provides habitat, and enhances the beauty of the landscape.

34| William McDonough and Michael Braungart. *Cradle to Cradle.* (New York: North Point Press. 2002.)p.68

Social equity becomes just as important as ecology and economics. In the example of the Ford plant, the company understands the concept of creating an enjoyable workplace to attract a creative, diverse, and productive work force. Natural day lighting was one of the major design factors. McDonough and Braungart worked with the existing high ceilings and large windows — a logical design feature at the time the plant was originally constructed, due to minimal electrical usage. It was also important to Ford to use design that enables a constructed environment, for the building to become native to its surroundings. From there, local solutions follow which ultimately embraces every aspect of what a company makes and how it is produced, marketed, sold, and cycled.

McDonough and Braungart have outlined "Five Steps to Eco-Effectiveness." These steps better define the principles of this term and contain design strategies that will aid in helping our environmental predicament. These steps can help our current industrial model obtain a more sustainable approach to production on all spectrum. The following is a summation for each step:

1. Begin to turn away from substances that are widely recognized as harmful, being sure that they are not merely being replaced with something worse. Keep in mind that being free of one thing does not mean that it is not free of some other harmful substance.

2. Follow informed personal preference. Make design

1.2 | Ford's Dearborn, Michigan Plant. [top left]
View of the green roof.
1.3 | Ford's Dearborn, Michigan Plant [bottom left]
View of construction marshes

decisions based on the information available and one's aesthetic judgment. It is sometimes difficult to receive the required information from manufacturers for legal and proprietary reasons.. Yet decisions need to be made by the designer as to which materials are sound enough to use. Some preferences to follow could be ecological intelligence, being sure that a product does not contain substances and practices that are blatantly harmful to human and environmental health, and also respect, this issue is at the heart of eco-effective design. This encompasses respect for those who make the product, for the communities near where it is made, for those who handle and transport it, and for the customer. Also important are delight, celebration, and fun — the importance of ecologically intelligent products to be at the forefront of human expression. This last point plays a key role in the work outlined in McDonough and Braungart's book.

3. Create a "passive positive" list. Going beyond existing, readily available information as to the contents of a given product, to conduct a detailed inventory of the entire palette of materials used in a given product, and the substances it may give off in the course of its manufacture and use, and then gradually replace these materials.

4. Create an Active Positive list where redesign begins in earnest. This is the point at which the designers and manufacturers move beyond trying to be "less bad" and start to figure out how to be good. Ideally, the goal is to set out to design a product from the beginning to the end, to become food for either biological or technical metabolisms. No longer just substituting materials, this step involves starting from scratch.

5. Reinvent. Do more than design for biological and technical cycles. Recast the design assignment, moving beyond a single product to the systems implicated in it. The goal is no longer to design to minimize the impact to the planet but rather to generate nutritious effects on the environment.[35]

35| William McDonough and Michael Braungart. *Cradle to Cradle. (*New York: North Point Press. 2002.) p.166

Sustainability is a word that is tossed around very loosely in popular culture with little regard to what it actually means. In the material world it is being tacked onto any substance or consumer good that has at least one small aspect of sustainable design without any regard to the product as a whole or whether it is a safe material to use. Take fibre that is made from recycled plastic bottles as an example. This fibre is typically used in carpet or to make synthetic fleece jackets. It is called sustainable simply because it has recycled content in it. The fact that the fibres can be inhaled and cause adverse effects on the human body is not considered when labelling this produce as green or eco-friendly. It also overlooks the added energy and processing needed to force a material that was never designed to become fibre in the first place into a carpet or fabric.

Thomas Homer-Dixon argues that merely striving to be sustainable is not enough, that we should actually strive to be resilient. Being sustainable suggests that we simply want to meet the status quo and marginally get by without becoming resilient to any change. Being sustainable also suggests that we are not willing to give something back to the planet.[36]

The following will outline some basic fundamental ideals for the purpose of defining what sustainability means to this thesis. These are ideals that would ensure a more environmentally resilient industry and economy. They are not fuelled by economics in any way but rather by the best interests of the planet and its inhabitants.

Energy Consumption:
Does it require a large amount of energy to extract and manufacture a particular product or material? If so, perhaps another option or technology would be best suited for the application. Is the product worth making in the first place? There are a lot of natural resources that require large amounts of energy to extract them and produce them. Take a typical aluminum pop can for example. Its bauxite ore is mined from somewhere in Africa, India or Brazil. Then the aluminum is shipped to be refined into alumina, a process that requires a large amount of energy. It is further refined using more electricity to separate out the moulten aluminum metal. Once refined it is made into sheet goods that in turn are used to make pop cans. The sheet goods are shipped to facilities that make the cans and fill them with a beverage. They are then distributed to the consumer who will use it and discard it within a matter of days. If they are recycled by consumers in Canada, they may be shipped to the US to be materially recycled in a factory. This is a best-case scenario since the metal is being reused, alleviating the need for more raw material and energy to refine it. It takes approximately 229 BTUs of energy to make one ton of aluminum cans but only 8 BTUs when the aluminum is recycled. Recycling saves 95% of the energy needed to produce aluminum from bauxite ore.[37]

Distance Travelled:
One should consider where the product has come from. Did it have to be shipped from half way around the globe to get here? Is it locally grown or extracted?

36| Thomas Homer-Dixon, *The Upside of Down: Catastrophe, Creativity, and the renewal of Civilization*. 2006.

37| EPA: *Municipal Solid Waste - Commodities: Aluminium*. June 14, 2007. http://www.epa.gov/epaoswer/non-hw/muncpl/alum.htm

These questions are important to consider because of the carbon footprint that each product leaves behind. For an item to be shipped it has to go on some form of transportation. The majority of transportation methods require combustion engines that consume fossil fuels in order to run them. This process introduces large quantities of green house gasses into the atmosphere.

Renewable Resource:
Is the raw material made of a renewable resource? This refers to a resource that can be easily and readily replenished after it has been extracted, as well as resources that are manufactured using renewable energy. This kind of energy is usually hydro, solar, or wind energy, the most common renewable sources.

Socially Responsible:
This criterion looks at human rights. All companies have an impact on people who work for them and the communities within which they operate. Was this product made in factories with safe and humane working conditions? Are the employees paid fair wages? Are they treated properly? Are any of their basic human rights being violated? This category also brings into question fair trade. Fair Trade, as defined by the group FINE[38], is "a trading partnership, based on dialogue, transparency and respect, that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalized producers and workers – especially in the South." Essentially, social responsibility entails asking: was the value of a human life overlooked for the sake of producing a product?

Human Health:
Is the product made of materials that will introduce toxins to the end user? Could long-term use of these products cause adverse health effects, mutations and or deformities, particularly in future generations? Human health is directly related to Environmental Impact since both address the effects on the planet's inhabitants.

Environmental Impact:
Will the manufacturing and use of this product introduce toxins and pollutants into the environment? For example, are these toxins leaching into water systems, into the air, into fertile soils? This affects us and every living creature on the planet on many different levels.

This is the basic foundation of ideals to describe what sustainability means for the projects described in Part Two. These ideals also dictate the criteria that are considered when designing and building any of the design projects showcased in this thesis. The topic itself is wide spread and an overwhelming task to undertake. This is not what this thesis is setting out to do. The purpose is to define sustainability to the extent that it pertains to design. There is no black and white when it comes to sustainable products. At least for the time being, we need to take things in stride. To achieve a completely sustainable product, we need to operate within completely environmentally sound parameters. Every step of production would have to be sustainable, down to the material chosen and the method of disposal. Since we are not yet at this point and will not

38| FINE was created in 1998 and is an informal association of the four main Fair Trade networks: Fair trade Labelling Organizations International, International Fair Trade Association, Network of European Worldshops, and European Fair Trade Association.

be in the near future, we need to begin with a wish list of ideals that are worth striving for.

Even so, there are some categories that will not be met with the reinterpretation of some of the objects used for this study. The fact that I am working with found objects implies that there is already some damage done with the initial production of certain items. For example, there is already a certain amount of embodied energy or there may have been some unfair trade in the manufacturing and distribution of the item. It may even contain toxins that have been introduced long before they have been acquired for adaptive re-use. The materials chosen for these projects are not hazardous materials and can be worked on without safety equipment required.

The idea is to give a second look at these discarded materials and, by virtue of example and design, to show what could be done with these objects. The design becomes a physical exploration of these materials. The re-use of products saves on energy required to recycle products that were not meant to be recycled. It keeps precious resources out of landfill sites and gives them new life. It is also intended that the end products are durable, ensuring their longevity.

2.0 | Shampoo Bottle Pendant Light [right]

PART TWO DESIGN

The value of design cannot be underestimated. This topic is important to this thesis because part of my argument is to say that design can make a difference in how we perceive trash and discarded materials and how we can reuse them. The designs in this section focus on small-scale projects. People are drawn to the tactile nature and accessibility of small-scale projects such as furniture pieces. These smaller-scale projects allow the viewer to observe the natural world through a particularly well-focused aperture thus refining one's vision to appreciate what is right in front of them. Each project in not a definitive solution in itself but rather a suggestion or a journey to a host of answers for our current environmental needs.

In design we seek and expect variety not consistency.

STUART WALKER. *Sustainable by Design*

Design makes a difference because it is eternally evolving and changing. There are endless developments with materials, techniques and processes. Designers play a key role because they are responsible for making the vital materials and production decisions for consumer products. They are problem solvers by the nature of their work.[1] Design sits at the meeting place of science and art. It is neither science nor art; it is simply and captivatingly designed. This thesis attempts to generate solutions that defy the norm, challenge convention, and re-conceive what design and products might be.

It is my hope, through this approach, to find ways in which people can connect with the materials and the design of an object to aid them in making more sustainable decisions about what they purchase and consume.

When designing with aesthetic in mind, one first needs to consider where our aesthetic decisions are derived from: personal experience, memory, notions of taste, and conventions of beauty. Aesthetic is an outcome of the approach to the design that has differing objectives. The object must have functional attributes, must follow the sustainability outline that was previously stated and it must be aesthetically pleasing. The aesthetic for these pieces can be referred to as "raw elegance," maintaining the rawness of the material and an essence of its former life, while implementing elegantly clean lines, connections and finishes.

Using recycled material works but it still uses up energy and can mean that the raw material is being down-cycled.[2] This in one of the incentives to using found materials. If some of the Cradle to Cradle approaches previously mentioned were to be implemented, it is conceivable that there may be, in the future, whole market niches in which designers are designing with used or salvaged material. In this case it would be considered as a nutrient and not as a discarded object. Some designers even make a living by avoiding designing new objects altogether. This is done by re-using buildings or designing solutions to a problem that does not involve building a product. For example, stamping people's notebook with contact information instead of giving out business cards.

1| Cara Brower, Rachel Mallory, Zachary Ohlman. *Experimental Eco-Design*. Rotovision, SA. 2005.

2| Down Cycled refers to the process of recycling a material into a material of lesser quality. This is often the case with most plastics. They are often not designed to be recycled in the first place and are therefore forced to change into a new product. The consequence of this is that the polymer fibres tend to get shortened in the recycling process which makes the plastic less manageable.

The Salvage Journey

The ambition is to find a methodology for these designs. These designs incorporate salvaged materials within an informal economy which removes the waste from the threshold of the household or business and takes it out into society to be reprocessed into desirable products.

This is the basic formula for salvaging, regardless of its initial requirements or incentives. Salvaging can and does occur throughout the world for several reasons. Salvaging was widely used during wartime, most notably seen in propaganda posters during World War II where citizens were either guilted into contributing by having their patriotism questioned should they not. It is used out of necessity in underdeveloped countries as building materials or as source of income. In the favelas of Brazil's urban cities, most of their building material is salvaged.[3] As a source of income in India, people take second hand clothing and recycle it into other garments of clothing, rags or simply resell them as second hand clothing.[4] This niche market allows lower income families to make a living. From colonial times to the present, it has always been more economical to use salvaged metal rather then acquiring new materials.

Each of these exercises became an adventure that the little girl had experienced. Each having its own story and each touching on a certain topic of interest. The circumstances by which the objects are found or salvaged are seemingly random. It is a combination between choosing the type of project or idea that she wanted to manifest and finding objects that crossed her path. Some objects she sought out and others simply came to her. Some were rather ordinary items that accumulated around her with the natural pace of life.

This type of sourcing of materials led to two distinct approaches to the design of a project. The first being if the project is established before the material is found. In this situation she has to be creative about what material would best suit the application and function. This would require a more intensive search for a certain kind of material or object. The second approach happens when the material or objects are already present or found. In this condition she must be innovative about what the material can accomplish.

3| Drummond, Didier. *Architectes Des Favelas. Les Pratiques De l'Espac*. Paris: Dunod, 1981.
4| Kuchler, Susanne and Daniel Miller, ed. *Clothing as Material Culture*. 2005. p. 85

Design Approach

The design approach is primarily about making products that are desirable, fashionable and by their nature affordable, using eco-friendly materials and processes throughout the design development as much as possible.

The following is an approach to using salvaged, re-used, or surplus materials/objects for re-adaptation:

1. Clean materials or objects if required, being careful not to handle any hazardous material with bare hands.
2. Examine the product or goods for quality, strength, finish, shape, weight, toxicity. Toxicity should be avoided; none of the materials used in these projects were toxic.
3. The materials and objects need to be assessed: what is the material or object capable of? What applications is it suitable for? What could it become? Does the re-use of this object outweigh the benefits of leaving it in production or disposal? What impact would it have to re-adapt the object? Is this product easy to work with or will it require too much energy to handle?
4. Experiment with the item's capabilities. Work within its limits. Experiment with different configurations and connections. Experiment with different design applications.
5. Finalize the look and proportions of the finished piece. Polish all details and finishes.

All of these questions and more are assessed throughout the design process to ensure that the best solution is found for a particular project. By no means is there one good application for each material or object. An object or material can be used in many different applications and configurations depending on the requirements of a particular design project. In some cases it is only limited by one's imagination. In other cases it could be limited by certain material properties and capabilities.

Design Projects

The following is a list of design adventures that were undertaken and are featured in this thesis:

Main Projects

- Skateboard stool
- Tires Cushions
- Billboard Bench
- Bags for bags
- Hanging garden
- Plastic bottles

Small Projects

- Detergent Light Fixture
- Chip Bag Light Fixture
- Small Plastic Light Fixtures
- Plastic Pouch and Wallets
- Saddle Bags
- Salvaged Paper Note Pad
- Plastic Lab coat

billboard bench

One day the little girl and her family took a trip to the big city. She was so excited to go on a road trip. She loved road trips and going to new places. At one point she woke from a nap in the back seat. She opened her eyes to see large, wide stretches of highway; and highways upon highways. Over passes laced in and through each other. Their car was surrounded by many other cars and large trucks, all speeding to their destination. The dashed, white lines of the highway zipped by her. She could see tall, majestic towers in the distance. They appeared to grow larger and larger the closer they got to them. Her eyes were wide open with energy and excitement. So much was happening around her all at once. Cars would exit the highway as others entered. Yet others were changing lanes side to side as if dancing around one another. The little girl started to look past the cars and the stretch of highway towards more buildings and these large signs that seem to be suspended in mid-air. They looked like oversized posters. There was one with a fancy car in it, another with a pretty silver watch and another and another and another. She could not quite understand how they got up there so high or how they could make them so large. Those letters must be bigger then I am, she thought. On one of the signs she noticed that there was a man standing on a platform pulling down a large sheet of paper off one of the posters. At first she was amazed with the platform; it seemed to appear out of nowhere. Then she started to wonder where does all the paper go? Is it cut up into smaller pieces and used to draw on after? And what if someone makes a mistake printing on the paper, what happens to it then?

2.1 | Billboard Bench

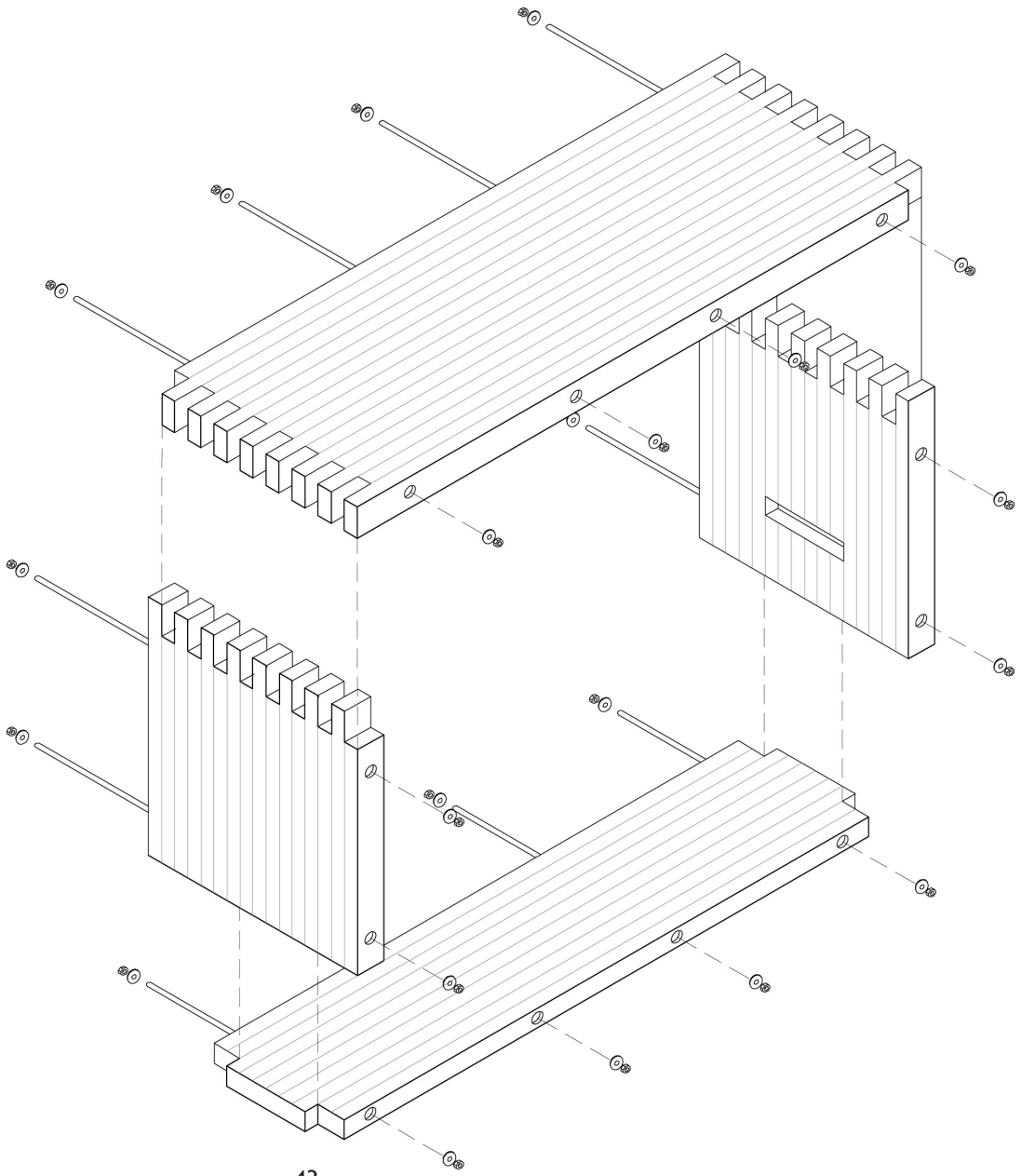
Signage companies have some very interesting surplus materials. One type of such materials is marine-grade plywood. This material is most commonly used for its ability to withstand the elements that an exterior sign would be exposed to. One of the restrictions to working with this material was that it had a plastic laminate on one side and a layer of Crezon applied to the other side to help make it smooth and to keep the grain back. The plastic laminate made it difficult to glue. The Crezon side could be easily glued but did not have a consistent bond with the plywood underneath it. On the other hand, the type of wood used had a wonderful end grain.

My goal was to make a sturdy bench that would show the animated end grain and that would showcase the fact that this was once a billboard. The proportions of the thickness were chosen both for their aesthetic quality and to help display the signage finishing pieces. The thickness is big enough to see that it was once signage yet small enough that each character is not recognizable.

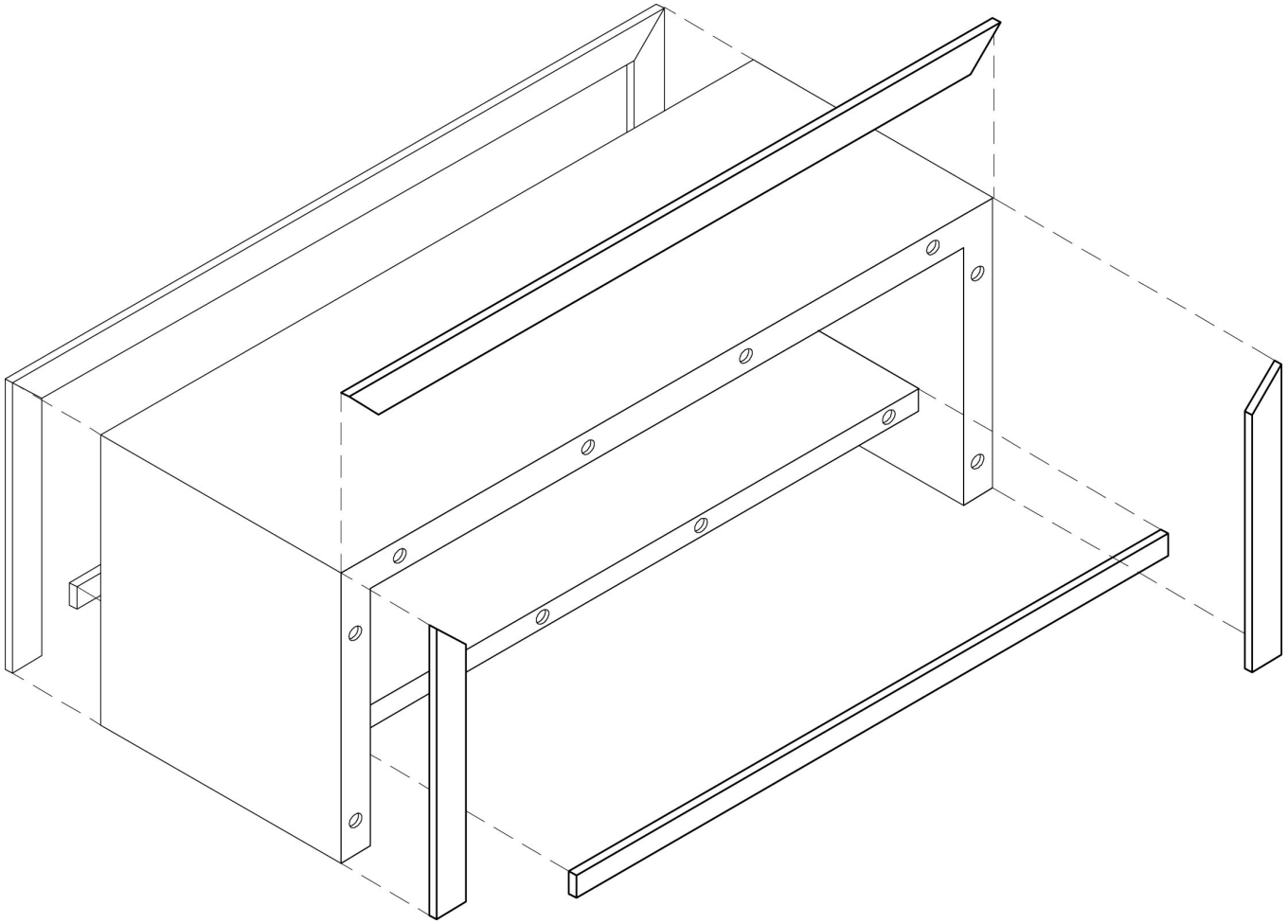
First strips of the desired width were cut for each section of the stool; the top seat, legs, and shelf. Due to the limitations of the material, it could not be laminated together. To overcome this limitation, a jig was set up to drill holes at certain intervals to take stainless steel threaded rods. These rods were strategically placed for structural support and held together with nuts and washers under compression. The only glue used was for the joints and the orange finishing pieces. Finger joints where used to join the legs to the top seat and a mortise joint to join the bottom shelf to the leg pieces. This bottom shelf serves both as a form of storage as well as lateral support for the bench.

This design, when planned out, produced little waste — sawdust from sanding, cutting and drilling and the odd off-cut of undesirable material. One must keep in mind that there may be some non-desirable material when using salvaged plywood. Some of the edges could be damaged or worn and do not have the desired strength or aesthetics needed for the piece. One could even plan out the dimensions of the bench based on the dimensions of the sheet goods found.

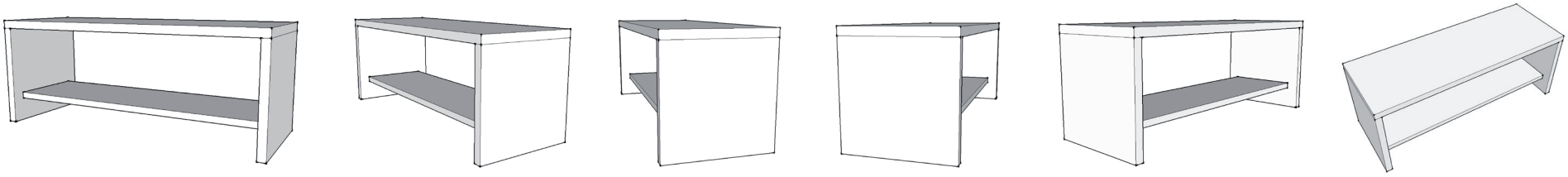
2.1 | Billboard Bench [previous page]
2.2 | Billboard Bench, detail [following page]



2.3 | Billboard Bench, assembly drawing



2.4 | Billboard Bench, assembly drawing of finishing pieces
2.5 | Billboard Bench, 3D sketchs [opposite page, top]



2.6 | Billboard Bench

The owner of the signage company stated that if this material was not salvaged, he would have been forced to dispose of it. When signs are re-used, it keeps the glues from the laminating process, paint and vinyl from going into landfill sites. Used plywood, in good condition, is a widely used and durable building material. It can be used in the construction of buildings, furniture, millwork, and more. Unless the plywood is severely damaged, there is no logical reason to dispose of it. If such a surplus of good quality plywood existed at this one, local signage company, imagine how much is sitting in dumpsters behind every other signage company. This is an abundant source of building material going to dump sites.

Advertising is a central means for businesses to increase their market share while also stimulating total consumer spending. Ironically, it is often to promote products that are detrimental to the consumer or the environmental well-being. The top most advertised products are automotive, food and restaurants, soft drinks and candy, and finally pharmaceuticals.[1] Globally, advertising expenditures hit a record in 2005 reacting $570 billion, 48% of which is spent in the United States. Ad spending took up $404 billion, directed towards major media, including television, newspapers, magazines, billboards and the Internet.[2] In major cities such as Toronto, advertisements are found everywhere. On billboards, on garbage and recycling bins, on the side of a bus or street car, in the subway system, even on taxi hub caps. It is relentless how much advertisement wants the attention of the consumer.

1| Vital Signs 2006-2007, The Trends that are shaping our Future. The World Watch Institute. W. W. Norton and Company. New York. 2006. p.. 54

2| Vital Signs 2006-2007, The Trends that are shaping our Future. The World Watch Institute. W. W. Norton and Company. New York. 2006. p.. 55

skateboard stool

One sunny summer day the little girl's father came home with a yellow, plastic banana shaped board that had four wheels attached to it. He told her it was called a skateboard and that you step on it with one foot and push with the other to get it moving. Excited, the little girl grabbed the skateboard, ran outside and placed it on the road in front of her yellow house. She put her left foot on the board and tried to do what her father said. At first she was disappointed to find out that it took a good deal of effort to balance on the board. She was stubborn enough to keep trying over and over again to balance on one leg and push with the other. Eventually she seemed to be able to coordinate her muscles to do as she pleased. For the better part of her summer break she kept at it and tried to go faster and faster on the board. At the time that is all she thought the board could do.

One day a friend of hers came along with a brand new, shinny, wooden board. It was wider and longer with grip tape on the top. It was also more stable then hers. She eventually got discouraged from it because she could not manage to do the tricks her friend could. Even though she did not continue with the practice, she still enjoyed watching others attempt to execute a trick successfully. She later learned about the history of skateboarding and how it stemmed from surfing. She became intrigued with the culture and the motion of the sport. Intrigued with how the skateboarder seems to swoop through the air and bounce from one obstacle to the other as if weightless. Or somehow defying the laws of physics while using them to his/her advantage. Intrigued with their desire to find the perfect city scape to ride on, regardless of boundaries or ownership. They are always in flight. Either on their board or from the authorities for trespassing. But they are not always graceful. Sometimes there are falls and brakes leaving many broken decks in the wake.

"What does one do with broken skateboard pieces?" She asked.

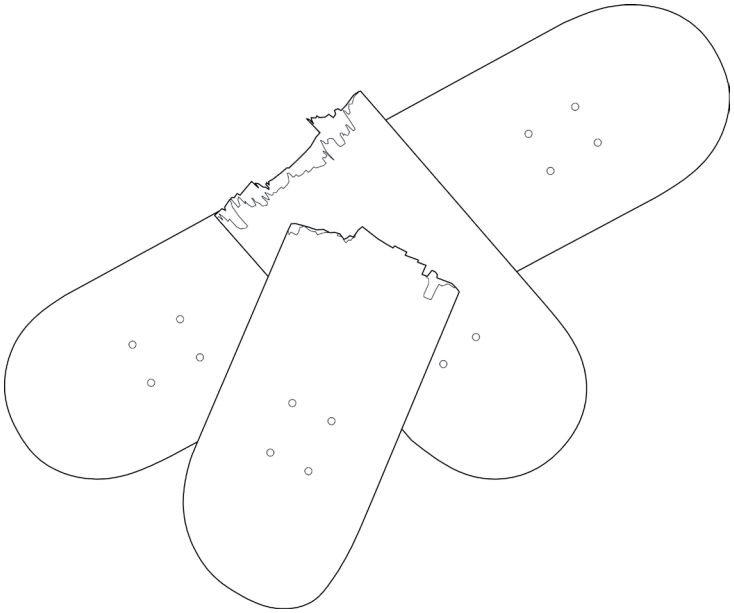
2.7 | Skateboard Stool, Disassembled.

The little girl wanted to make something out of the broken decks. Something that would still reflect what they once were; a means for self expression and individuality. Something that would demonstrate the back and forth motion of the board in a half pipe. Something that would express the constant flight in the movement and in the culture.

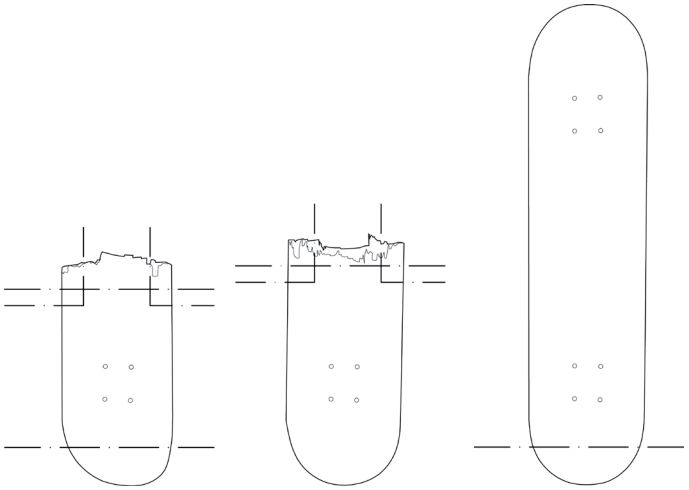
This stool is made from three pieces of different broken decks. It was designed so that it can be put together or taken apart easily to express the culture's need to flee a place quickly. The zig zag profile of the stool is reminiscent of the back and forth motion of a skateboarder in a bowl. The jagged edges are cut off and slots where routered into the desired locations to make the stool fit together. The grip tape and decals are left on the stool, recalling the board's former life. The tape is applied facing downward so that the person sitting on it is more comfortable. The stool is assembled from the bottom up to make sure that it stays properly balanced. The stool relies on gravity to keep it in place; a force that is both revered and defied in skateboarding practice.

This particular stool is a prototype and does not seem to hold the weight of a person that exceeds one hundred pounds without cracking along the existing brake. With proper balance, placement and selection of pieces, this can be quite a sturdy seat by virtue of the laminated hard wood used to make the board. It is also a light, easy to assemble piece that can be easily transported.

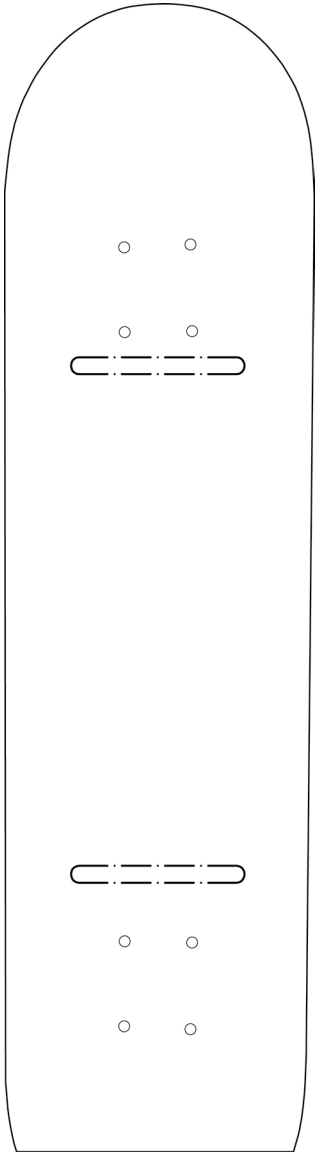
2.8 | Skateboard Stool [previous page]
2.9 | Skateboard Stool, Seated. [following page]



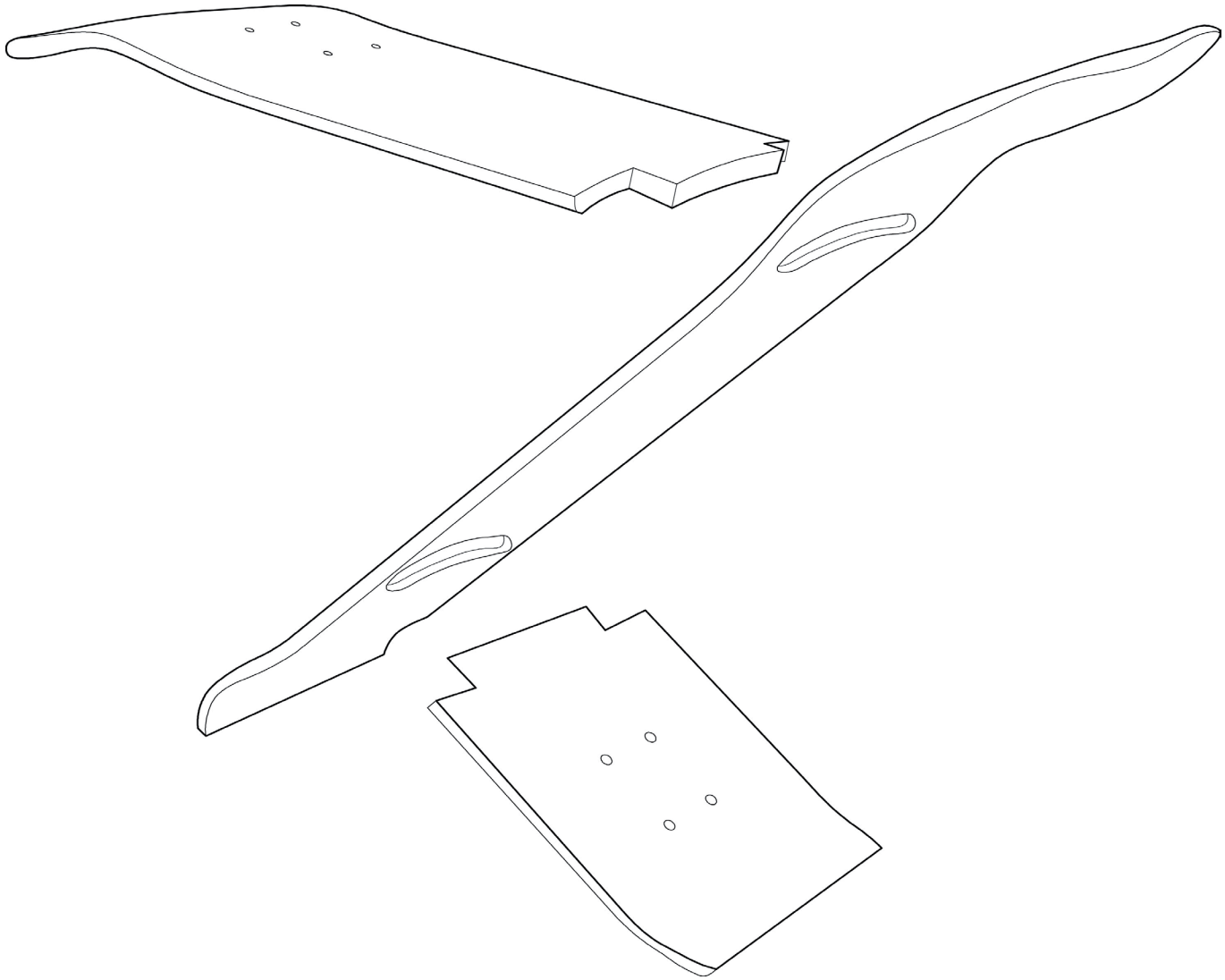
2.10 | Skateboard Stool, sketch of broken skateboard decks



2.11 | Skateboard Stool, assembly drawing showing cut lines



2.12 | Skateboard Stool, assembly drawing showing router cuts



2.13 | Skateboard Stool, assembly drawing

Skateboards spontaneously started out as inventive compilations of found objects to simulate the surfboard on land. They started out being made of wheels from roller skates and decks made of pieces of skids or crates or any type of wood the skaters could find.[3] This design returns them to their origins, while simultaneously using this aspect as inspiration for its redesign.

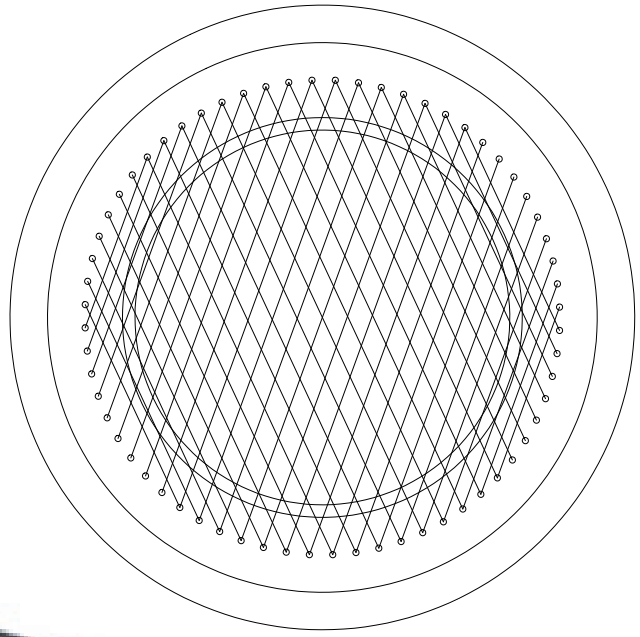
Most modern skateboard decks are now made of laminated maple hard wood. This is a valuable resource that is both durable and aesthetically pleasing. The Skateboard Stool becomes an attempt to reuse this resource with minimal embodied energy. By keeping this material from disposal, it keeps the glues used for lamination from leaching into the environment.

3| Documentary: *Dogtown and Z-boys*, 2001 , lords of Dogtown

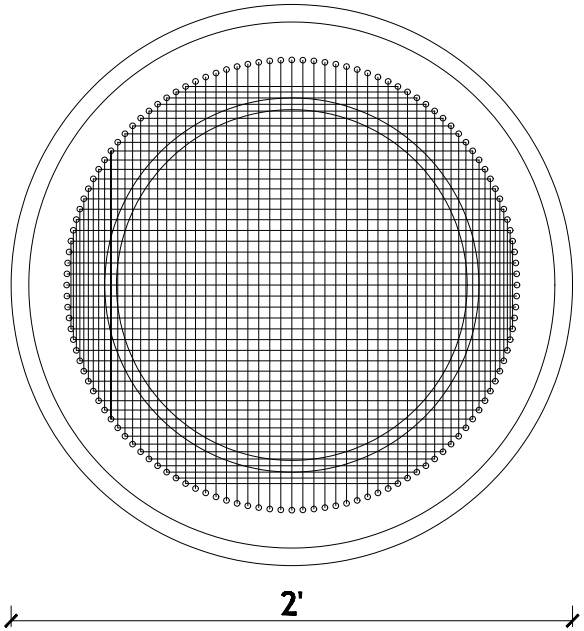
tire cushions

Tires were very intriguing objects to the little girl as she grew up. She was very familiar with tires. She used to help her grandfather change tires back in her homeland when she was younger. Her and her father would change the inner tubes on her bike tires at home. She had seen them lying around in the garage or used as a swing. Sometimes, when the tires were left outside in the rain, she would enjoy swishing the water around. She was fascinated with the centrifugal force that kept the water from falling out of the centre hole.

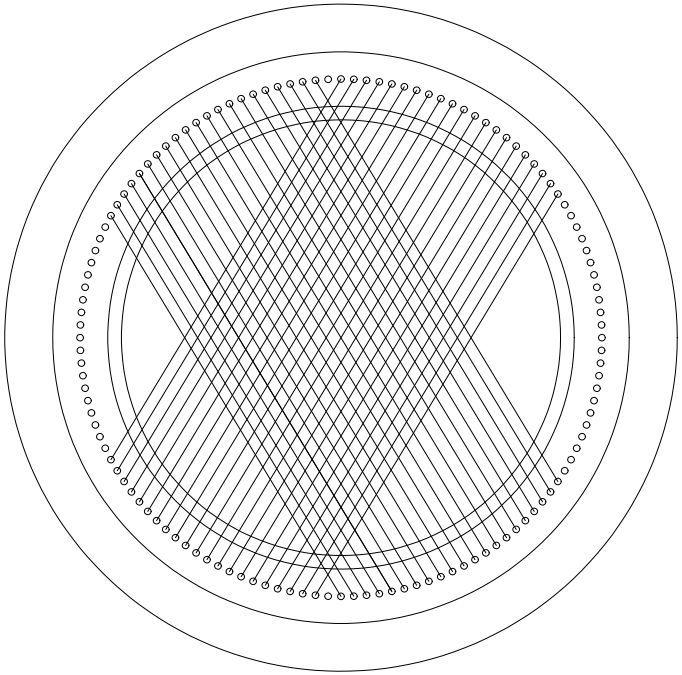
One evening, the little girl woke up to sirens in the distance. The family went outside to see if it was anything they needed to alarm themselves with. They could see in the distance a fiery glow in the night sky followed by thick black smoke. The next morning, she found out that a tire factory had burned down and released toxins into the atmosphere. The houses near by had to be evacuated for the safety of the residents. Some people had even thought that there was a conspiracy behind the fire since the owners did not seem to want to take on the expense to properly dispose of the tires. She started to wonder how all of those tires could have evaporated into black smoke. And why did they have so many tires lying around? Or why not reuse them to make something else out of them, such as a tire swing?



2.14 | Tire Floor Cushion, drawing of 1st weave [top]
2.15 | Tire Floor Cushion, 1st weave [left]

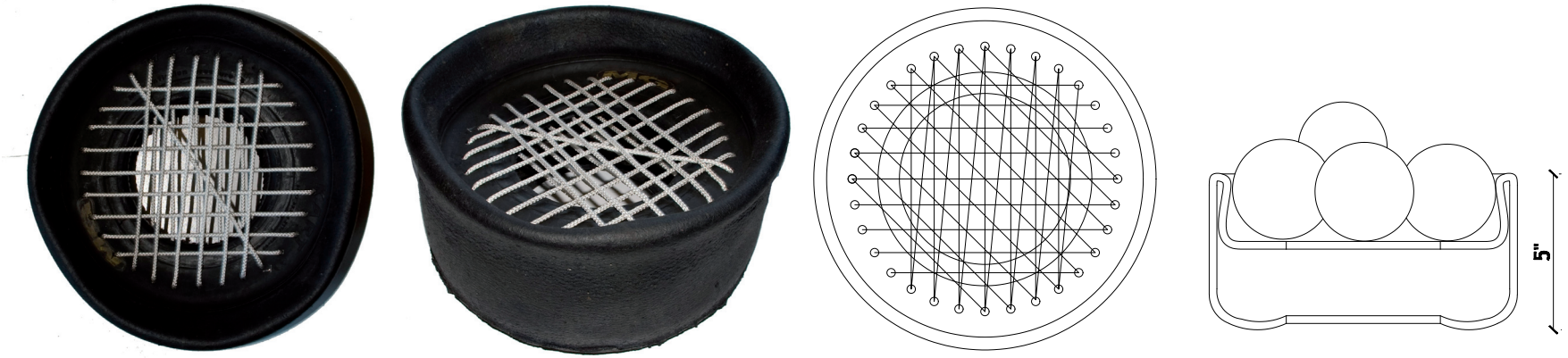


2.16 | Tire Floor Cushion, drawing of 2nd weave [top]
2.17 | Tire Floor Cushion, 2nd weave [right]



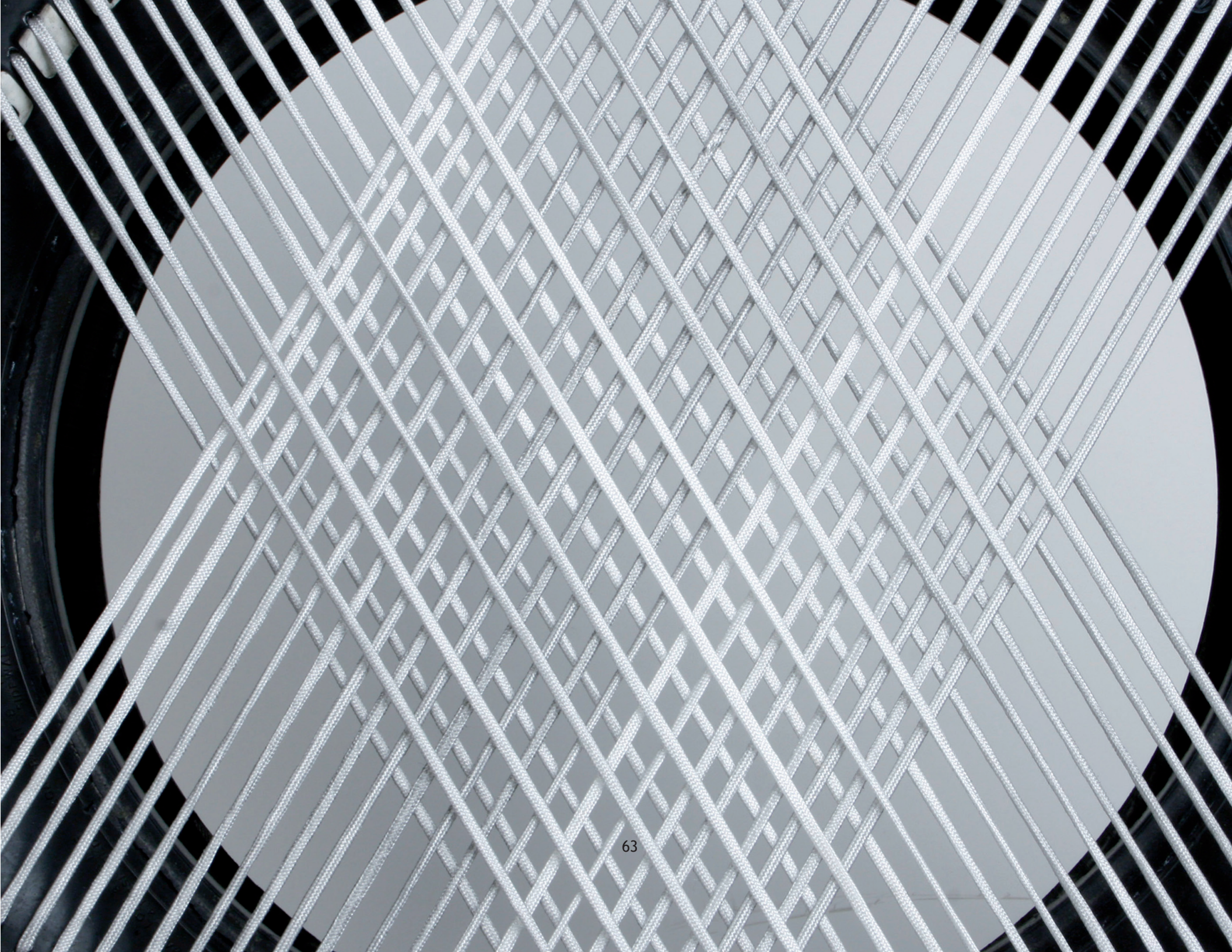
Inspired by the TransNeomatic Bowl by the Campana Brothers, these tire cushions are experiments in weaving to create the most comfortable and durable seat. They can be used on their own as a floor cushion or stacked to make a stool. Different types of ropes were also used to experiment with their aesthetic qualities against the black rubber. In all cases the materials are durable enough to be used in exterior conditions as well as interior. Because of their wheel shape, they can be conveniently wheeled alongside the user instead of carried. Used tires are easily obtainable; everyone wants to get rid of them. There are recycling facilities available now but it is not as easy as putting a blue box out on the curb. As the demand for cars increases so does that of tires. That means there are tons and tons of used tires out there just waiting to become stools or floor cushions. After thoroughly washing the tires with biodegradable soap, holes were drilled into the rims of the tires at equal intervals. A template can be made using an Auto CAD drawing. Once the desired frequency of holes are made, I began to experiment with different weaves to see which would work the best as well as have the best aesthetic quality. It was determined that certain weaves would create different types of point loads on the tires. The ideal weave would be one that creates a uniform load along the tire's rim otherwise the tire collapses at certain points. In general, the cushion is very comfortable. They can be used as a single floor cushion or stacked up on top of each other to make a taller stool.

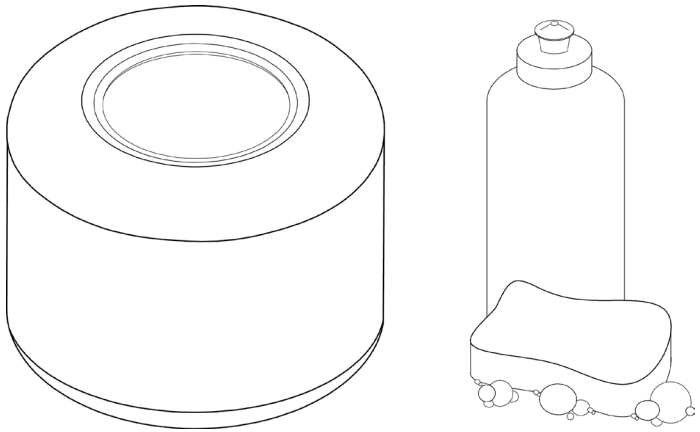
2.18 | Tire Floor Cushion, 3rd weave [left]
2.19 | Tire Floor Cushion Drawing, 3rd weave [above]



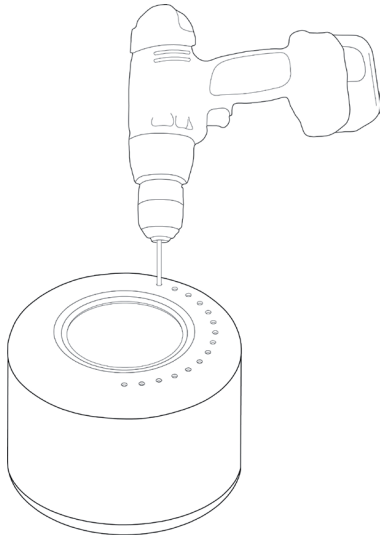
2.20 | Tire Bowl, plan + section
2.21 | Tire Bowl

2.22 | Mini Tire Cushion, plan + section
2.23 | Mini Tire Cushion
2.24 | Tire Floor Cushion, 3rd weave detail [following page]

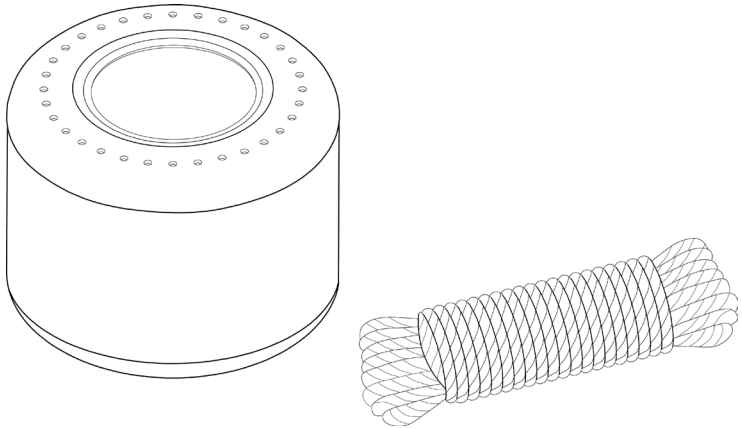




2.25 | First step: wash tires with biodegradable detergent.



2.26 | Second step: drill holes into top of tire to take weave.



2.27 | Third step: weave nylon rope through drilled holes. Experiment with weave. For maximum comfort weave rope from the inside of the tire, through the hole and over the top of the tire.

Tires are mostly made up of rubber, special oils, carbon black, pigments, antioxidants, silica, and other additives.[4] With the increase in popularity of personal transportation vehicles, used tires have become a significant portion of volume in solid waste management. Ontario alone generates approximately 10.4 million used tires per year.[5] According to the Waste Diversion Act, the term "used tires" is defined as waste that consists of any of the following materials, or any combination of them: Used tires that have not been refurbished for road use or tires that, for any reason, are not suitable for their intended purpose. Used tires generate a certain level of environmental concern for two main reasons. Aside from taking up landfill space, the disposal of used tires is at risk of fire or attracting pests. Fires from used tires not only releases significant quantities of toxic emissions into the air, they are also hard to control and extinguish. Furthermore, with extinguishing tire fires, pollutants can also seep into groundwater systems and waterways causing contamination to ground and surface water. Potentially dangerous mosquitoes use the water deposits in used tire piles as a breeding ground. These mosquitoes are potentially dangerous because they can be carriers the West Nile virus or other diseases.

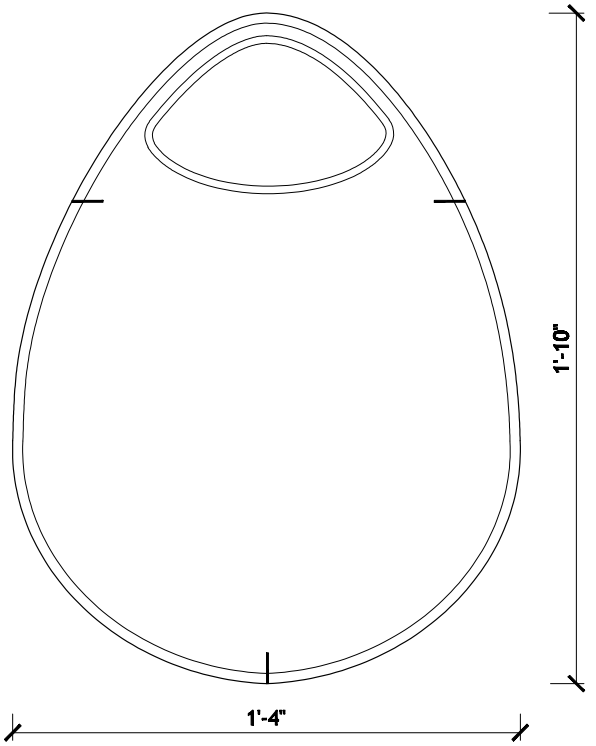
Current uses for scrap tires in Ontario can be summarized as:

- crumb rubber (~4.1 million PTEs),
- fabricated products (~0.75 million PTEs),
- civil engineering (~1.0 million PTEs),
- landfill (~0.75 million PTEs).[6]

Tires that do not end up in this waste diversion system typically end up in back yards, sheds, garages, lakes, rivers and streams or washed up on beaches. There are many kinds of alternative reuse available for this material. They can be ground up to make running tracks and other outdoor furniture/playgrounds. Tires are used to make foundation or retaining walls of houses or landscaping.[7] Other products are manufactured using recycled rubber content, rubberized asphalt, as well as some civil engineering applications that provide effective alternatives to aggregate and sand.

4| Rubber Manufacturers Association. Tire Safety. Retrieved September 20 2004
5| http://www.on.ec.gc.ca/pollution/ecnpd/used-tires_e.html
6| Report: Used Tire Program Plan. Ontario Tire Stewardship. 2009.
7| Article: Live in an Earthship. by: Ellen Craig. Mother Earth News. 2005

The little girl was playing in the school yard one autumn day. It was particularly windy that day. The plan of her school comprised of a U-shape that contained part of the playground. She became fascinated with a mini tornado that had formed in one of the corners of the playground by the building. It had swept in from the field and concentrated in the corner taking with it leaves and debris. This was a playful tornado, dancing carelessly about, not harming anyone. It was quite beautiful watching the colourful leaves dancing with it. The little girl noticed a white wrinkled plastic bag floating in the breeze. She watched it rise and fall and twirl around. It was almost hypnotic. The bag seemed to float weightless through the air. Its slow motion movement seemed to make time slow down. Where did this bag come from?



2.28 | Egg Shopping Bag [left]
2.29 | Egg Shopping Bag, pattern [above]

There is some irony in the re use of plastic bags to make bags. The function does not change but the aesthetics and durability does. This design provides a method for re-use as well as reducing the demand for new bags.

Making more durable, re-usable bags out of low density polyethylene grocery bags, is a simple process of melting several plies of the bags together to make a thicker, more durable material that resembles the texture of building paper. When the pieces are all sewn together, they make up a larger sheet of plastic. This can be made with different bag patterns and colours. The larger sheet can then be cut and tailored to any desired design.

Several types of bags are being designed to accommodate different uses: a hand bag, wine bottle bags, a grocery bag. The grocery bag can serve as a tote that could be used for many occasions such as grocery shopping, at the gym, for lunch, as a book bag, as a laundry bag, etc.. Inherently, it is a catch-all bag. They can be designed in differing sizes to accommodate several applications. They are meant to be useful as well as aesthetically pleasing.

The wine bottle bag answers the need for a stylish bag to carry your alcohol in. It could also serve as a gift bag that can be reused and passed on.

The handbag takes on a simple circular shape derived from the Egg Bag patterns. It is meant to evoke a stylish statement about the user's position on environmental issues. The salvaged satin straps sit over the shoulder while the bags nestles under the arm.

2.30 | Hand Bag [previous page]

How to process the bags:

Items need: 1 clothing iron
1 ironing board
2 large sheets of wax paper
Several plastic grocery bags

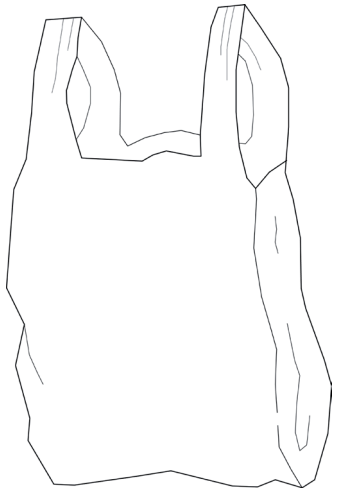
1. The handles and the bottom of the bag must be cut off.
2. Turn each bag inside out so as not to affect the ink that is used for printing logos.
3. Set iron to medium setting. Usually around the Rayon setting.
4. Turn the steam setting off on the iron.
5. Lay the bag flat on an Ironing board.
6. Fold the bag twice to make it into 8 ply in whatever shape desired.
7. Iron the bag flat between the two pieces of wax paper making sure to iron both sides evenly so as not to cause the bag to melt all the way through.

This material can be used for other applications as well. It does not have to be limited to bags. It can be used in the place of some fabrics to make things like curtains, aprons or pieces of clothing. It can be used as a durable liner or as bracelets for instance.

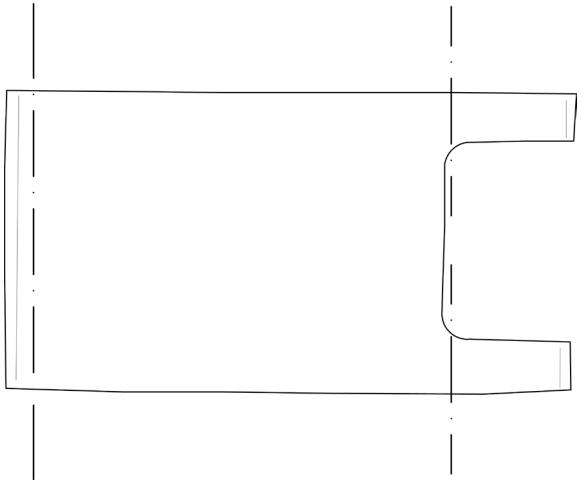
It requires approximately 5 ordinary size plastic bags to make one wine bottle bag, approximately 11 for the handbag and approximately 21 for the grocery bag.

2.31 | Rectilinear Wine/Lunch Bag

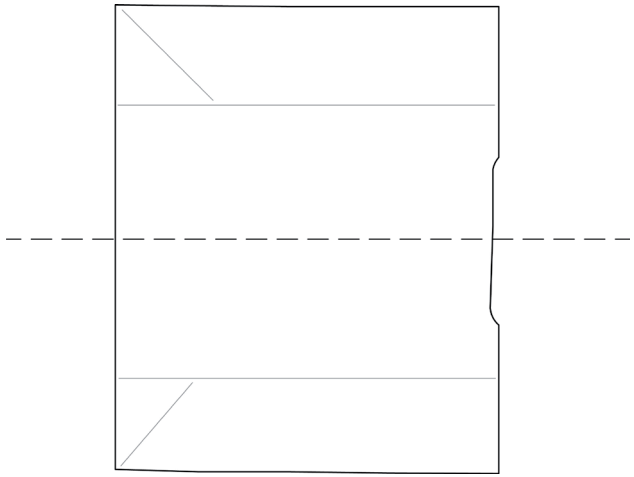
How to make durable plastic Material:



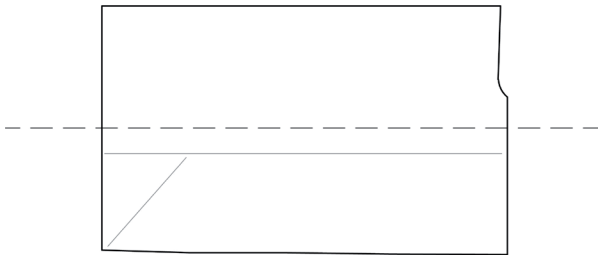
2.32 | Step One: gather disposable plastic bags.



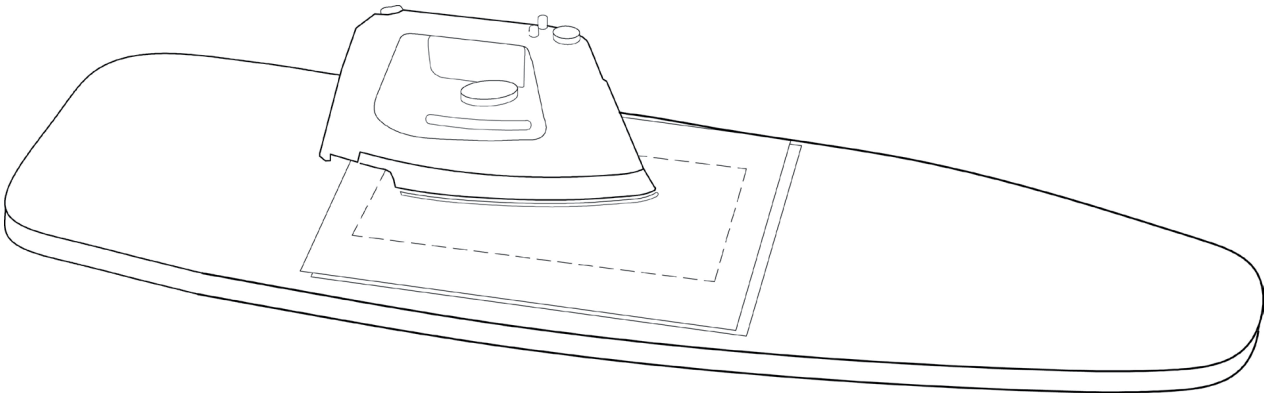
2.33 | Step Two: Cut off ends and handles to make it easier to iron later.



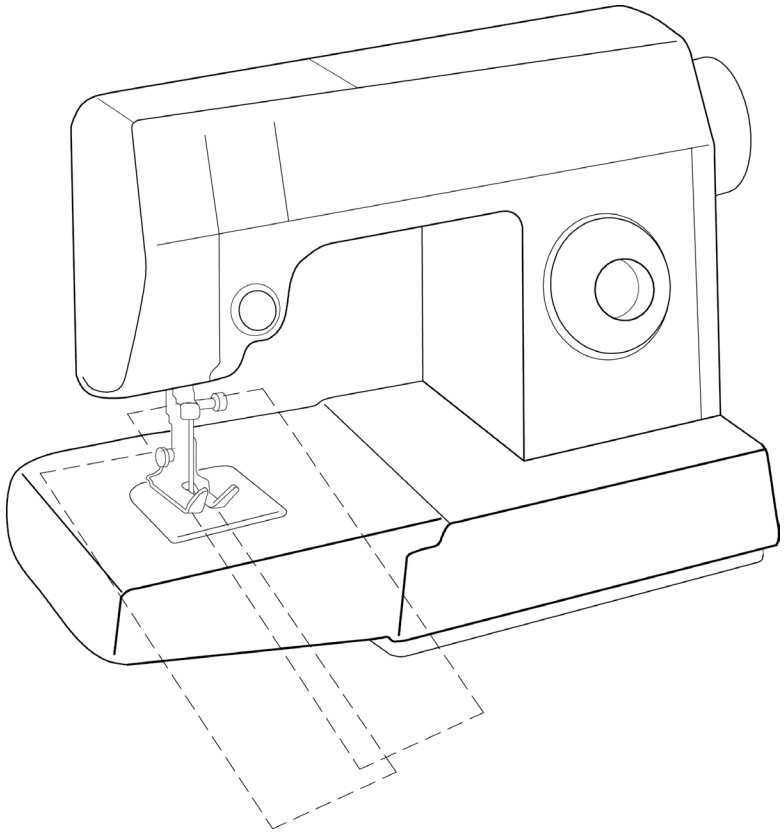
2.34 | Step Three: Turn back inside out, lay flat and fold in half, length-wise.



2.35 | Step Four: Fold bag in half again to achieve an eight ply thickness



2.36 | Step Five: Place folded bag in between two pieces of wax paper. Set Iron to medium heat and turn off the steam setting. Iron on both sides making sure to keep the iron moving at all times. This will insure that the plastic does not melt. The material is ready once it is completely fused together and does not separate when rubbed together.



2.37 | Step Six: Once fused together, the pieces can be stitched together using a zig-zag pattern on a sewing machine. Take two pieces of material and overlap them slightly, then run them through the machine.

Most people have seen or heard of plastic bags drifting in the high seas or in a river, they have been known to be ingested by turtles who mistake them for jelly fish, clogging storm drains, cluttering landfills, and getting caught on a tree or in a fence.[8] Plastic bags, more often then not, end up in dumping sites even though recycling systems are available. Below is an outline of Toronto's waste management systems, the agreement the city has with Michigan and how a landfill site works.

As of January 2003, the city of Toronto closed its suburban Keele Valley Landfill and began shipping its garbage across the Canada-US border into Michigan. The Keele Valley Landfill is now most commonly known as the Eagle's Nest Golf Course, a Scottish-style country golf club. In that year a volume of 2.7 million cubic meters of nonhazardous waste (enough to fill a football stadium) was initially trucked out of Canada.[9] The city has signed a contract with the Carlton Farms Landfill in Michigan until the end of 2010. To bounce back from economic decline, the state of Michigan has reinvented itself over the past decade as the base camp for some of the largest handlers of municipal solid waste in North America.

It is not a small feat to engineer a landfill site. One needs more then just land for dumping. Careful preparations of the landfill's sub-base must be executed to insure that any harmful leachate does not escape into the soil or any near-by water sheds. The landfill is first shaped into a giant bathtub followed by five layers that make up the sub-base: three meters of natural clay, sixty centimeters of re-compacted clay, a two millimetre thick high density polyethylene (HDPE) liner, a double-sided geocomposite drainage blanket, and, to top it off, sixty centimeters of granular material.

Ironically, nothing goes to waste in a landfill site. Each shipment of solid waste becomes a building material that paves the way for dumping trucks and bulldozers. The trash is spread out and flattened in a timely manner to keep the system moving as quickly as possible to enable the site to receive more business. A refined scrap material called auto fluff uniquely supports the speed of operations. A by-product of Detroit's automotive scrap industry, auto fluff is a mixture of all the different foams, plastics, and rubbers from the scrapped cars. This by-product is applied as a daily cover to act as a multifunctional surface. It reduces odours and prevents wind-blown debris, but most importantly it prevents rutting and flat tires.

Landfill sites also re-circulate water to increase the rate of compactions. Solid waste is thirty to forty percent liquid that ends up filtering through the strata of garbage over time. This leachate collects at the base of individual landfill cells in sumps and is continuously evacuated to limit its depth on the bottom

8| Article: Are plastic grocery bags sacking the environment? National Geographic News, John Roach. September 2, 2003.
9| Article: Airspace. Trash by Alphabet city. Pierre Belanger. 2007 p.133

of the landfill. Landfill gas produced by re-circulating leachate indirectly made the Michigan landfill sites into energy generators. Under anaerobic condition, re-circulating leachate produces landfill gas, otherwise known as methane. Over a hundred cubic meters of gas is produced every minute for a total of 453,000 cubic metres every day. The Carlton Farms Landfill generates ten megawatts of energy from methane combustion every year and feeds it back too the grid. Thus providing ten thousand homes with electricity each year.

Despite some political efforts to stop the flow of trash from Canada to Michigan, the landfill operators in south-eastern Michigan see things differently: "We love Canadian garbage. It's really easy to compact because it's really dry. It's dry because the Canadians compost almost everything."[10]

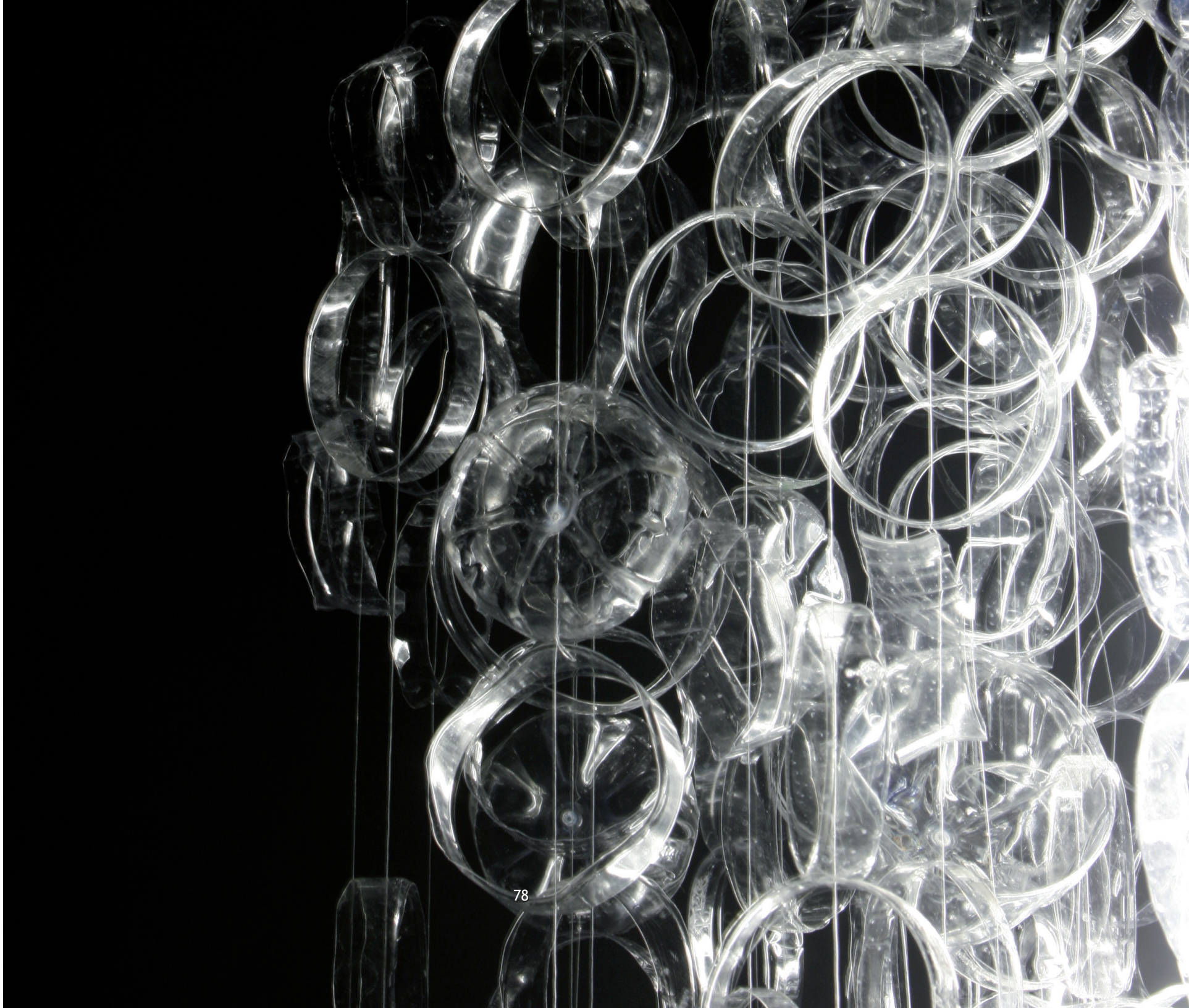
Landfill sites of this magnitude alter the landscape and topography drastically. What starts out as a three-metre excavation will turn into a ninety-meter mountain, irreversibly transforming the landscape of Sumpter Township. What will be left is a mundane silhouette with a 4:1 slope filled out in three dimensions.

10| Article: Airspace. Trash by Alphabet city. Pierre Belanger. 2007 p.150

2.38 | Rounded Wine Bag

plastic chandelier

It was a bright summer's day and the little girl got on her red speed bike to go for a ride. She raced down the hill towards the lake. The breeze was cool against the warm kiss of the sun on her cheeks. She headed towards the docks where she liked to sit with her feet dangling over the retaining wall to watch the birds flying above. As she sat there enjoying the breeze and the sound of the water lapping against the dock she noticed a clear container like thing bobbing up and down in the waves. It slowly got closer and closer. Soon she could recognize it as a plastic bottle. It was a bit tattered and cloudy from being out in the water and perhaps washing up against something. She remembered the message in a bottle story she once heard. How a person would put a message in a bottle and send it out to sea to be carried along by the currents to another shoreline in the hopes of making contact with someone else. As it turned out this bottle didn't have a message in it like the story but it did send a message. She began to wonder how many bottles where floating out in the lake right now and how many were in the oceans and seas of the world. Did any one of them have a message inside or do they all have a message to tell?



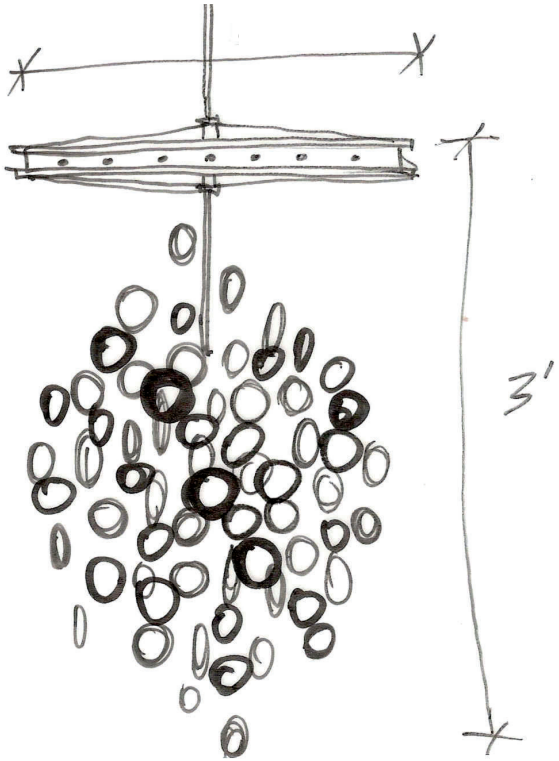
One of the most recycled plastics is Polyethylene terephthalate (PET). They are now recycled to create fibres to make fleece clothing, carpets, reusable grocery bags, and more.

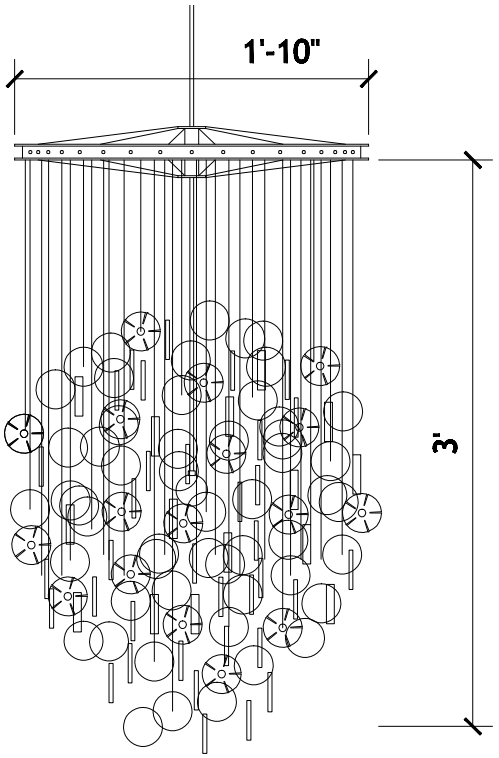
This design initiative constructs a chandelier out of plastic bottles pieces and a bicycle tire rim. The rim was shined using a cream de tartar paste; a proven effective, environmentally friendly way to shine aluminum. The rim was outfitted with a single fluorescent tube light fixture through the centre axle. Care was taken to choose a low wattage fluorescent light bulb so that the plastic bottle pieces would not melt from any heat emitted.

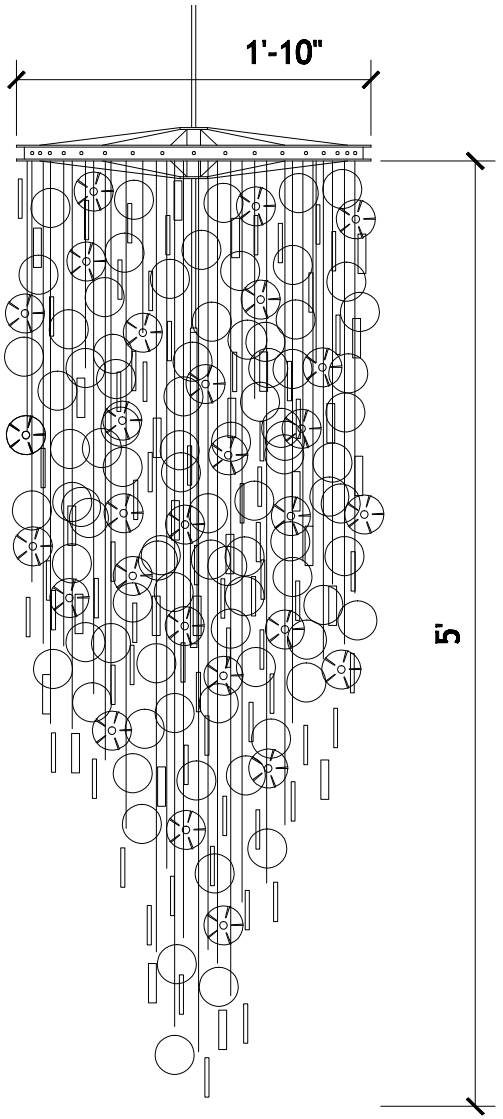
Several plastic water bottles were essentially sliced to make rings out of the bottle's circumference. These were hung from the tire rim using transparent string to create a weightless floating effect on the rings of plastic. The plastic rings were arranged in a cascading form, longer at the centre of the fixture while getting progressively shorter around the circumference. The fixture, when in place in a voluminous space, drapes elegantly from the rim. An added flowing effect occurs when a breeze catches the strings of plastic rings creating a whimsical subtle sound in the process.

This chandelier is constructed of approximately 50 clear, half litre, plastic water bottles.

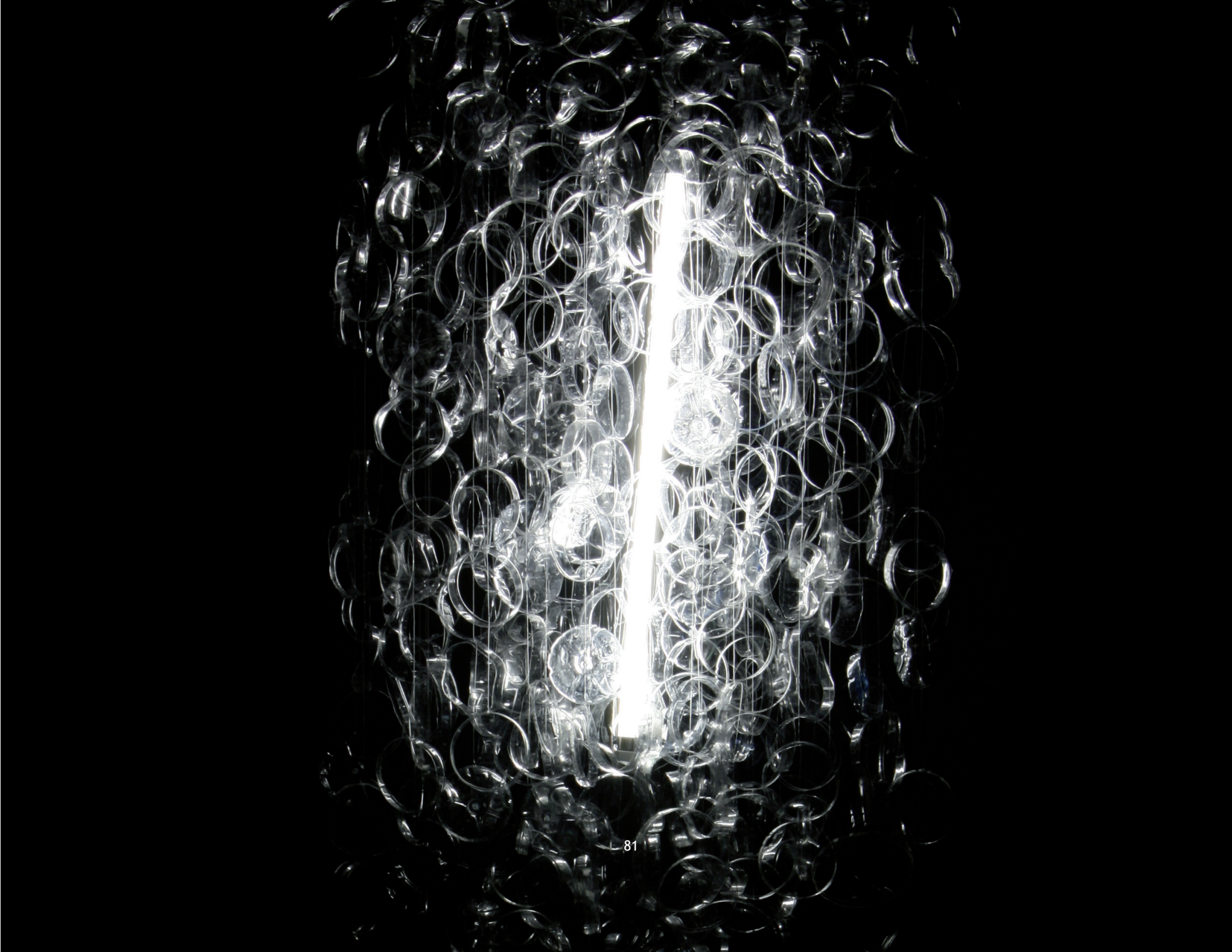
2.39 | Plastic Chandelier [left]
2.40 | Plastic Chandelier detail [opposite page]

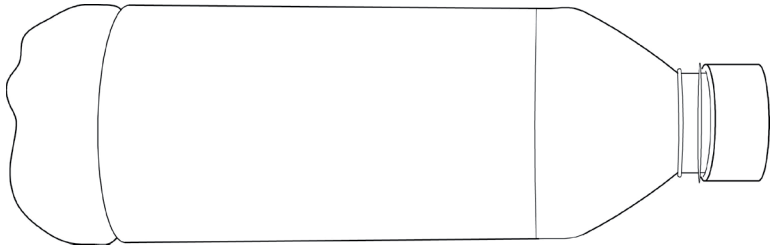




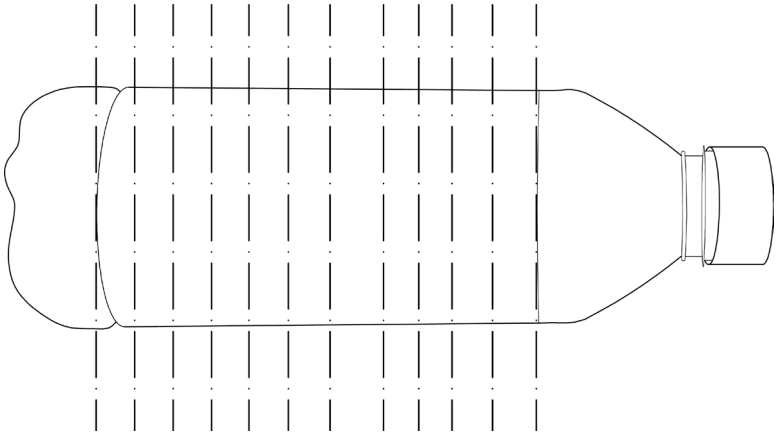


2.41 | Plastic Chandelier, sketch [top left]
2.42 | Plastic Chandelier, elevations [top centre + right]
Sketches showing the progression of the chandelier design
2.43 | Plastic Chandelier, detail [following page]

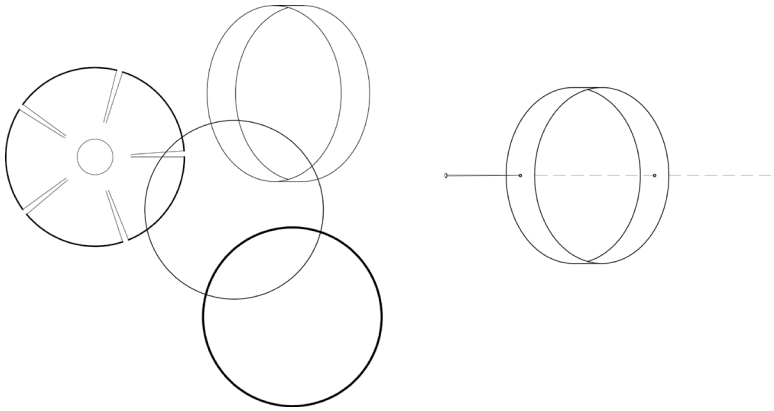




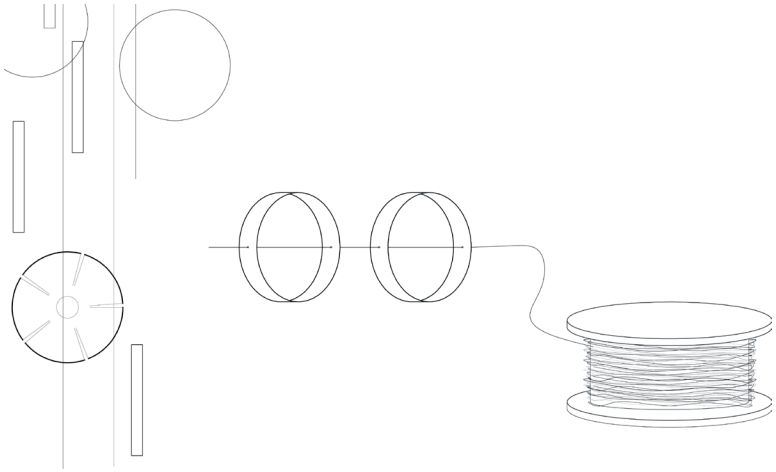
2.44 | Step One: Gather clear PET bottles.



2.45 | Step Two: cut the bottle into slices using an exact-o knife.



2.46 | Step Three: punch pinholes directly across from each other in each ring that is formed from slicing the bottle.



2.47 | Step Four: Thread rings through the pinholes with clear fishing line to the length desired.

In the northern Pacific Ocean, there is a dead zone between Hawaii and California called the North Pacific Sub-tropic Gyre, a slowly moving, clockwise spiral of currents. This creates an oceanic desert, filled with tiny phytoplankton but few big fish or mammals. Due to these conditions it is fairly easy for any floating debris that is floating along in these currents to collect here. The majority of the debris consists of plastics. This garbage patch is considered to be the world's largest dump. Scientists have estimated its size to be twice that of the State of Texas. This debris is not just on the ocean's surface, it is estimated to reach 100 feet in depth, not including the 70% of which sinks disturbing life on the ocean floor. This debris comes from anything that has ended up in any of the water systems that deposit into the north Pacific. Plastic constitutes 90% of all trash floating in the world's oceans.[11] The United Nations Environment Program estimated in 2006 that every square mile of ocean hosts 46,000 pieces of floating plastic.

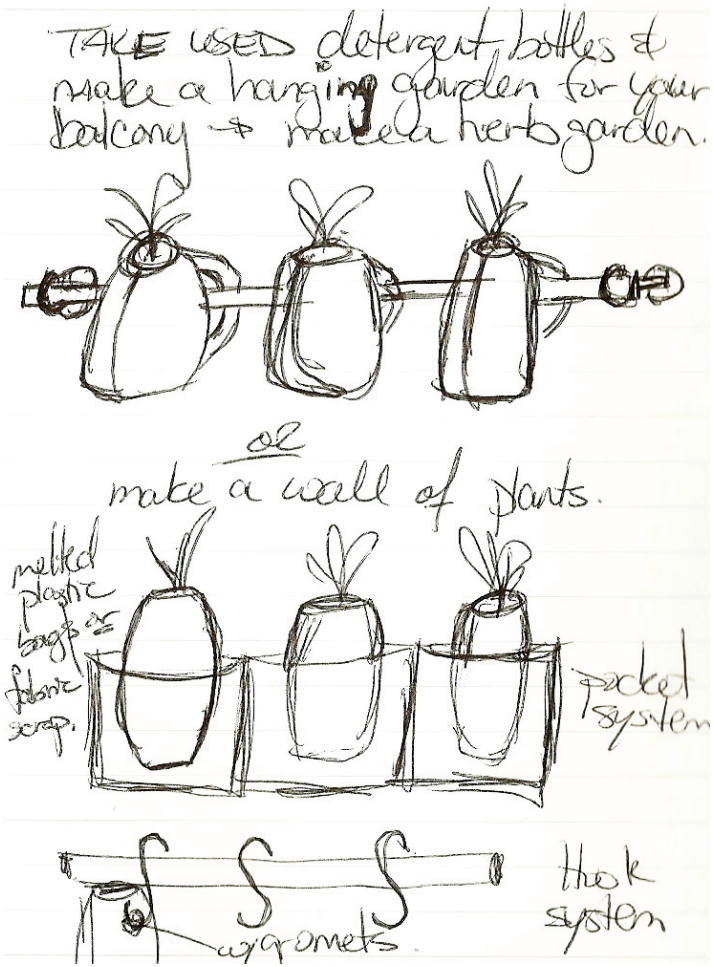
Of the more than 200 billion pounds of plastic the world produces each year, about 10% ends up in the ocean. The very thing that makes plastic items useful to consumers, their durability and stability, also makes them a problem in marine environments.

This makes one think twice before sending a message in a bottle.

11| LA Times . Article: Why is the world's biggest landfill in the Pacific Ocean? By Jacob Silverman

hanging garden

When the little girl was still living in her homeland, her family lived in a small apartment in the city. It had two enclosed balconies. One was for laundry and the other was for the a little garden room that was filled with potted plants. They went all the way up the wall on floating shelves. She used to play in there with her toys sometimes. All year round she could go into her own little private garden where the plants bloomed bright and green.



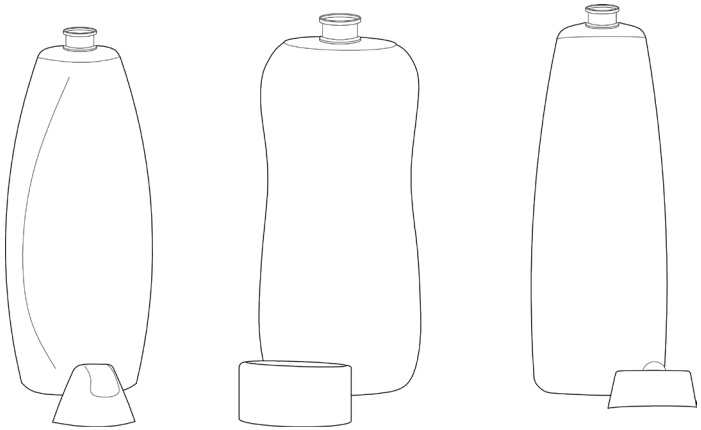
2.48 | Hanging Garden [page 85]
2.49 | Hanging Garden, sketch
2.50 | Hanging Garden, detail [right top]
2.51 | Hanging Garden, details [right bottom]

The hanging garden is a design exercise that addresses the lack of green space in urban spaces. Since space is limited, the proposal is to create a vertical garden. By collecting desired plastic bottles from ordinary every day products, one can begin to accumulate containers for each plant. A grommet is placed on the backside of the container. This allows for a hook to be installed in order to hang the container. An existing hanging system could be used, such as those found in kitchen departments. Or, one could fashion a rod out of salvaged material from which to hang the containers.

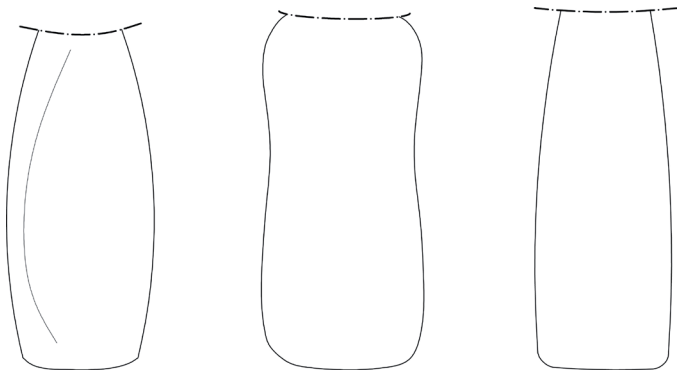
Drainage must be provided by either drilling drainage holes at the bottom if they are being installed somewhere they can drain or by putting a layer of light weight, natural material called Vermiculite on the bottom of the container approximately one to two inches in depth.

One can use the same kind of container for a modern, repetitive look. For an eclectic look, use different types of containers; even old tins or jars.

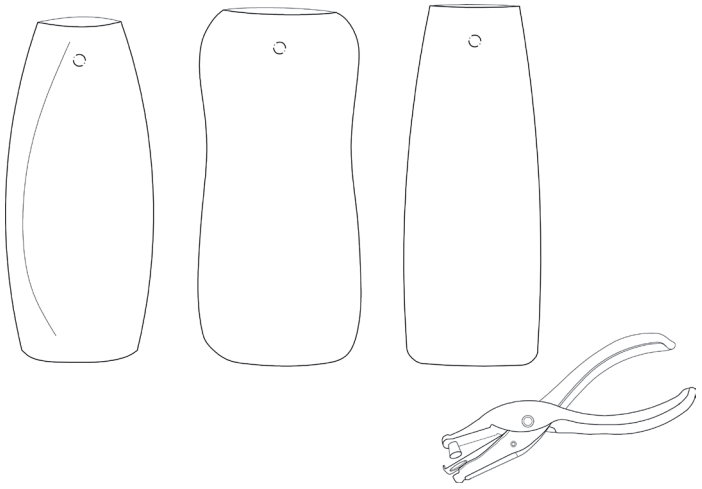
2.52 | Hanging Garden, detail [right]



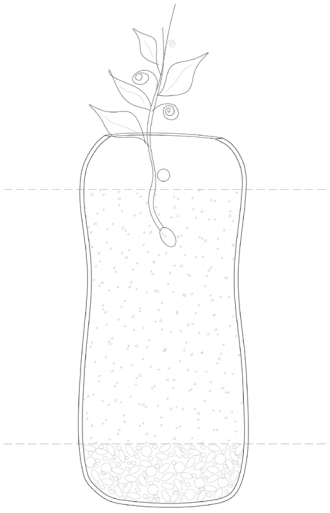
2.53 | Part One: Collect desired containers and bottles. Then remove their tops and lids.



2.54 | Part Two: Make a cut along the top of the plastic bottles, following the existing shape of the bottle.



2.55 | Part Three: Using a single hole puncher, punch a hole on the top back side of the bottle to take a hook for hanging.



2.56 | Part Four: Fill the first 1-2 inches of the container with Vermiculite. Fill the remaining depth with potting soil or seed starting soil. Place the seed at the required depth and water.

This project is focusing on urban environmental limitations with respect to gardening and the latest movement to eat local foods as much as possible to minimize our ecological footprint, looking at how population growth and mass migrations into cities increase these environmental limitations.

As of 2005 the world's population topped at 6.4 billion. This is more then twice the amount of people that inhabited the planet in 1950. Ninety-five percent of the population growth is in the developing world.[12] According to the United Nations Population Division, by 2007 more people lived in cities around the world then in rural areas. India has more then 30 cities with populations over 1 million. China and India are experiencing some of the fastest rural-to-urban migration in history.

12| Vital Signs 2006-2007, The Trends that are shaping our Future. The World Watch Institute. W. W. Norton and Company. New York. 2006. p. 74

small projects

Plastic Lab Coat

The Lab Coat was also fashioned out of the durable material made from fusing disposable plastic bags together. It was designed for use at the World Environmental Education Congress where this work was exhibited as part of the Dodo Lab creative research initiative.

An existing dress pattern was altered into a wrap around coat resembling the style of a kimono. The white portion was created using white disposable plastic bags. Care had to be taken to put the logo towards the inside of the coat. The black strip was formed from black garbage bags to add a dramatic accenting trim. The coat is held closed by a piece of surplus, black, satin ribbon that is the same proportion as the black plastic trim to polish it off.

2.57 | Plastic Lab Coat [left]

Detergent Pendant Light Fixture

This hanging pendant light was made using a laundry detergent bottle as the lamp shade. The shade hangs from a simple and inexpensive light kit that can be easily obtained at any hardware store. This particular kit uses a low wattage fluorescent light bulb to keep the heat emitted to a minimum. This light fixture was made to illuminate the skateboard stool for the exhibition. The bottom of the bottle is cut out to allow for a spotlight effect, while the shade casts a soft, warm orange glow throughout the space

2.58 | Detergent Pendant Light Fixture [right]

Chip Bag Pendant Light Fixture

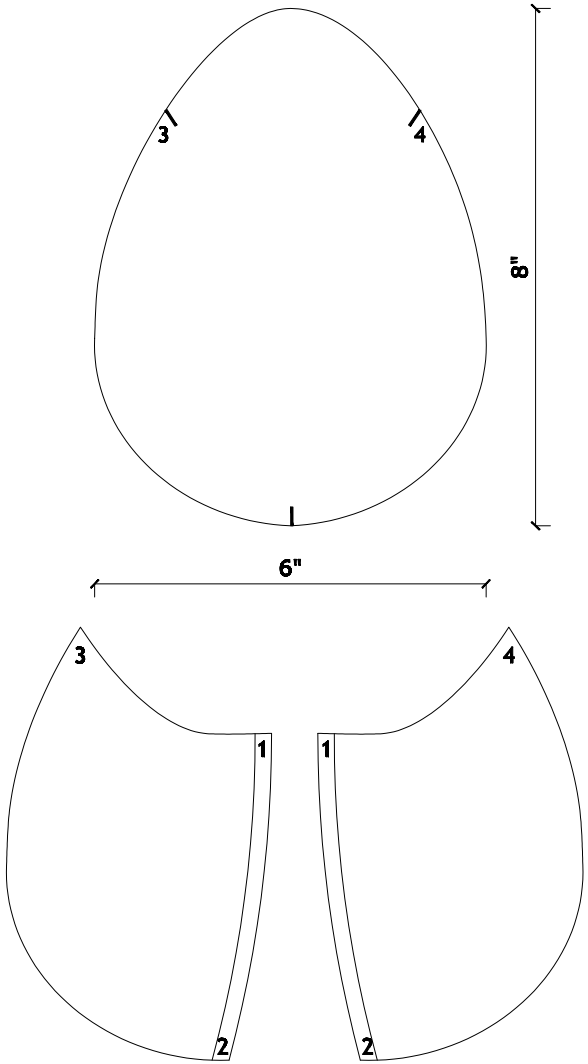
This pendant light fixture is made of salvaged lamp shade frames obtained through the Freecycle Network — a now international forum for individuals and nonprofits to trade and recycle objects — and covered by chip bags. This light fixture uses the same kit and light bulb applied to the Detergent Bottle light fixture. Chip bags are easily cleaned then laid over the frames to be fit and trimmed. The bags are finally glued to the frame using a hot glue gun. When lit as a pendant they cast a wide spotlight over the intended objects as well as emit a glow from the shade. The glow emitted will differ depending on the nature of the chip bags used. These fixtures were used in the exhibition to light the Tire Cushions and the "Bags made of bags."

2.59 | Chip Bag Pendant Light [left]

Small Plastic Pendants

This fixture is designed to hang together in a line of three small pendants or in a cluster of pendants as shown here. The lampshades used were also obtained through the local Freecycle Network. The shade is covered using the plastic bag material used in the reusable bags to bags project. The graphics and colours used on the shades are only limited by the bags that are available to use. The shades can range from playful to colourful to simple elegance. This light fixture was installed in the exhibition to light the length of the billboard bench.

2.60 | Small Plastic Bag Pendants [right]



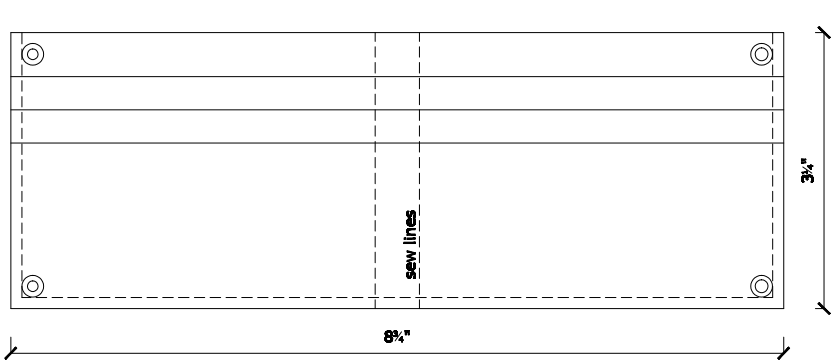
2.61 | Plastic Bag Pouch [left]
2.62 | Plastic Bag Pouch Patterns [above]

Plastic Bag Objects

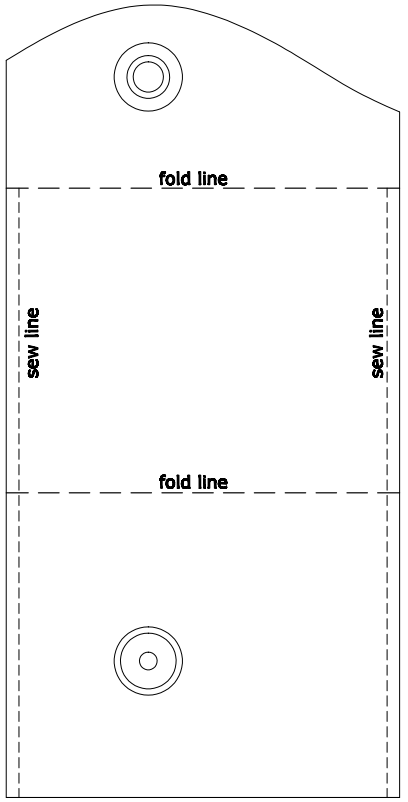
These objects are all fashioned out of the durable material made from fusing disposable plastic bags together. All of these items were made for and during the World Environmental Education Congress where they were exhibited as part of the Dodo Lab creative research initiative.

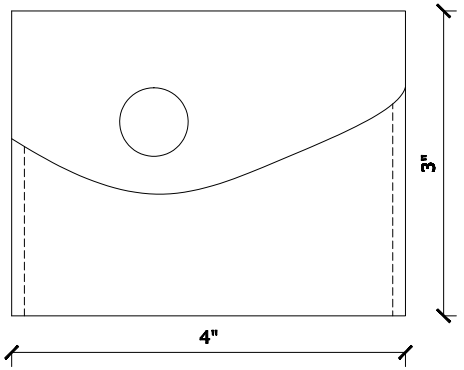
The Pouch was designed with the intent of giving it away with seed bombs that could later be planted in the pouch and hung much like the Hanging Garden project. These versatile pouches can also be used as containers at an office desk or in an art studio. The egg shape is an interpretation of the larger Egg Bag in the bags to bags project. The wallets were made with strips of the durable plastic, sewn together and clips put on them to close completely.

The change purse takes a single strip of the plastic that is folded and sewn to create a pouch for change or any loose items. A clip is attached to keep the purse closed.



2.63 | Wallet Patterns





2.64 | Change Purse Patterns [above]

Saddle Bags

These saddle bags were designed to fit my motorcycle in such a way that they would be comfortable for a passenger to sit on the back seat with the bags in place. They take a similar organic shape as the egg shaped bags to maintain a similar aesthetic as the previous projects. These saddlebags were re-interpreted from existing, worn, black saddlebags. The fabric was replaced with surplus banner material on the exterior and lined with the durable plastic material from the bags to bags project. The piping, zippers and straps were refurbished from the existing saddle bags to maintain the same function. Strips of reflective tap were sewn on the outer panels for added safety when riding at night.

2.65 | Vinyl Saddle Bags [left]

Salvaged Paper Note Pad

This note pad is made of paper that has been collected from the recycling bins of misprints beside the printers at the School of Architecture. The pieces of paper chosen were printed on one side only and in excellent condition. The paper was cut to size and assembled between two pieces of scrap leather. The binding hardware was also salvaged from a dated paint chip fan.

2.66 | Note Pad, binding detail [top right]
2.67 | Note Pad [right]

PART THREE EXHIBITION

Recyclables Installation

This installation is composed of recyclable containers that are collected from the third floor studios at the University of Waterloo, School of Architecture in Cambridge. This installation acts as a quantitative study of how much recyclable packaging is used up by the students during a period of approximately one month. The intent for this installation is to demonstrate, visually, our contribution to waste collection. Being aware that this collection comes from those who are willing to recycle and take the time to do so. The containers were collected from six bins, once a day, at the end of the day.

This exercise brings into question whether waste diversion is working or is enough as an initiative to waste diversion. Would it be better to reuse? Why not just have a re-usable bottle or glass filled with tap water or juice?

Inspired by the work of Cornelia Parker, the composition of the containers was intended to take on a sense of weightlessness to provoke the viewer and evoke a sense of awe. This gesture intentionally takes ordinary objects out of their prescribed place in society and places them unavoidably in the viewer's line of sight. The recyclable containers are thus transformed from objects that are otherwise easily ignored and places them in a state where they can be admired and observed. The mass of weightless containers begins at the centre with a dense collection of cans and other solid containers. The mass progressively becomes less dense as it moves away from the centre using first translucent containers followed by a layer of transparent containers.

3.0 | Installation, detail [previous page]

The Disposable Container

The birth of the disposable bottle or container opened up a new packaging market which exponentially filled landfill sites. First introduced in the 1930s, it took off in the post war period of the late 1940s and 1950s.[1] A 1947 ad for one of the first no-deposit, no-refund disposable bottles seems as absurd as telling someone to drink and drive or smoke while they are pregnant, with the exception of the fact that the user does not experience an immediate adverse effects. By the late 1970s and the 1980s the re-usable bottle was phased out creating an onslaught of packaging production and therefore contributing to unprecedented levels and new types of garbage. Today in the US, one-use wrappers, boxes, cans, and bottles take up more than a third of the country's landfill space.[2] Most of which are technically recyclable but end up in the trash regardless. Over 95% of beverage containers consumed today are in non-refillable bottles.[3] This makes for significant profits

1| TRASH by alphabet city, edited by John Knechtel. The MIT press, Cambridge, MA. 2007. Message in a bottle by Heather Rogers.
2| Fenner and Gorin 2; US EPA 2003, p.7
3| www.container-recycling.org/glassfact/decline.htm

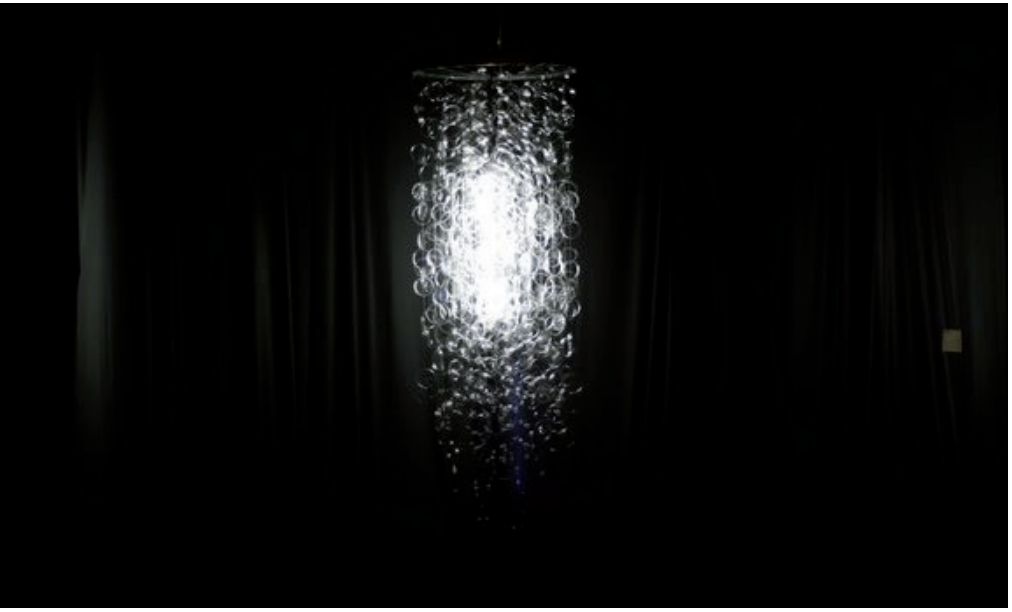
for packaging manufacturers. Since the consumer was willing to pay for the added price of the bottle along with the contents, manufacturers could introduce a new form of almost hidden consumption. Its predetermined fate as waste has become acceptable on a cultural level and therefore making it barely perceptible as a commodity. Yet it is made up of natural resources, requires human labour to produce and produces a profit. Container makers had an obvious advantage. The more units that get discarded, the more new sales they would benefit from. Not only that, it is a marketing benefit. By packaging beer and soda in novel, eye-catching, one-way vessels, companies could pull consumer's attention away from their rival, allowing for a "non-price product promotion" where they gain their edge with flashy packaging instead of lowering prices.

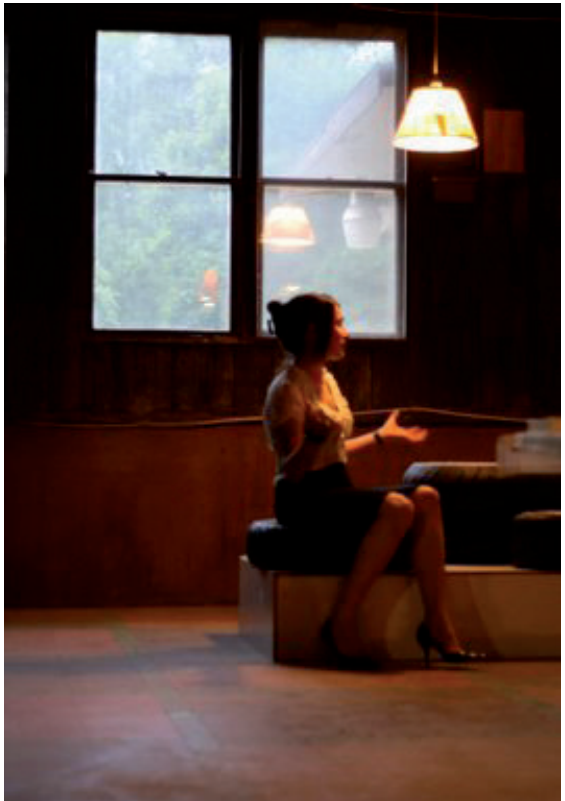
This new phenomenon caused a rippling effect on our culture and manufacturing in North America. It caused the monopoly of beverage providers. Of the 5,200 soft drink makers in the US in 1947, only 1,600 were still in business by 1970. It was even more extreme in the beer industry where in 1950 the US had more then 400 breweries. That number fell to 64 in 1974.[4] The Environmental Protection Agency (EPA) said that the monopolization in the brewing industry was "encouraged and permitted by the introduction of non-returnable containers".[5] It therefore led to the restructuring of consumption patterns. Individually bottled beers in a six-pack were replacing keg distribution to taverns. The grocery business was also changing by eliminating the added labour time and the expensive storage space that reusables required. The resulting surge of waste was staggering. The whole packaging industry even managed to externalize the costs by passing them onto the consumer, the municipal refuse collection, and to the environment. Packaging and drink makers worked diligently throughout the 1970s on the political front to undermine attempts to introduce new legal controls on wasting. Along with monopolizing the market and lobbying the government, these corporate companies have also managed to reshape public opinion about waste.

4| Heather Rogers. TRASH by alphabet city, edited by John Knechtel. The MIT press, Cambridge, MA. 2007. p. 118

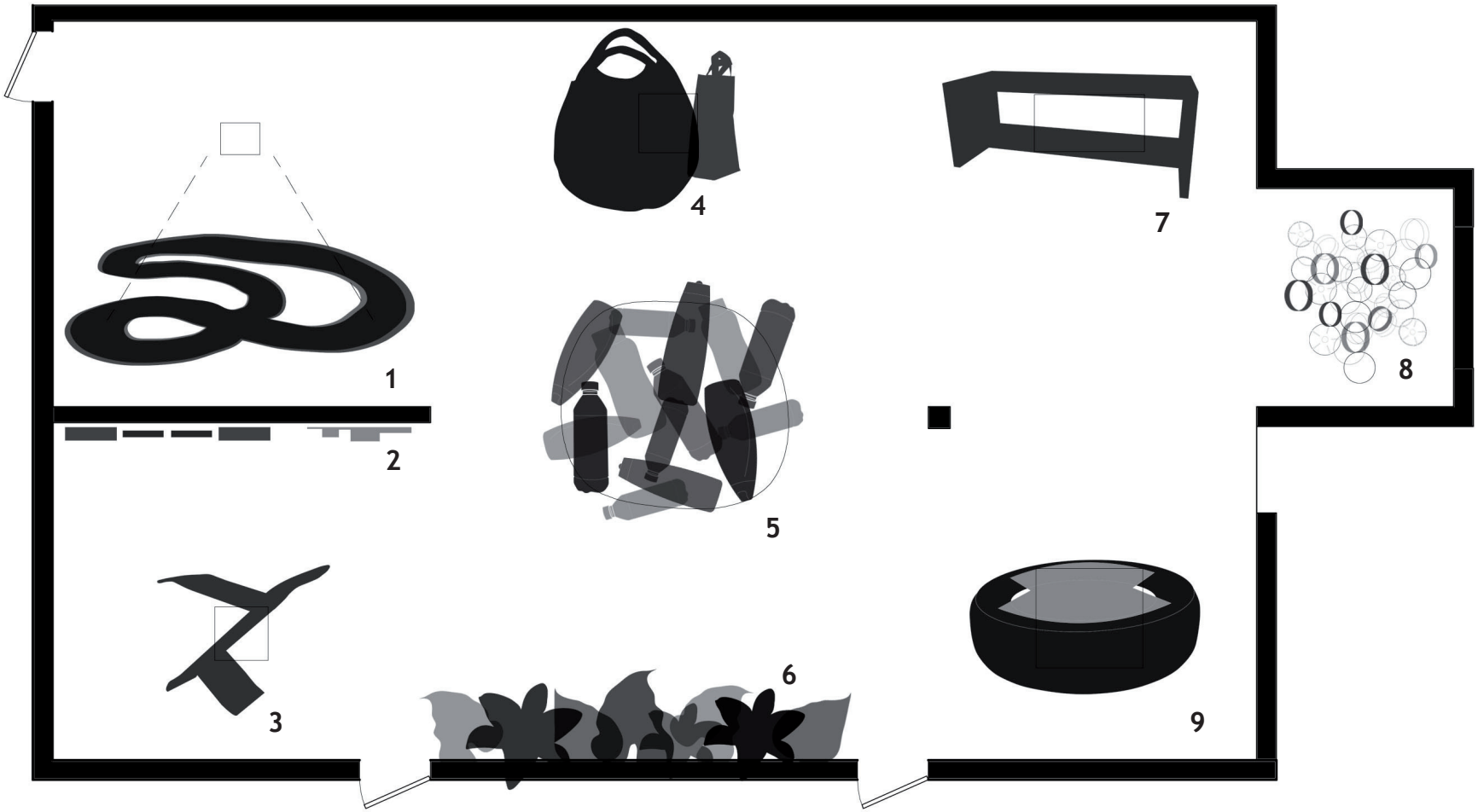
5| Lezra 5. TRASH by alphabet city, edited by John Knechtel. The MIT press, Cambridge, MA. 2007. p.118

3.1 | Recyclables Installation





3.2 | Photos of Exhibition



1. racetrack recreation
2. framed packaging/connections art piece
3. skateboard stool
4. bags to bags
5. recyclables installation
6. hanging garden
7. billboard bench
8. plastic chandelier
9. tire cushions

conclusion

The intention of this thesis was to attempt to provoke the public into reconsidering their definition of trash or discarded material. Our society works within an industrial system that leaves us with the burden of a surplus of discarded material. The objective was to re-evaluate what we perceive to be waste and reinterpret it by employing creativity and utilizing the least amount of energy possible. There were two distinct approaches of experimentation in regards to each material chosen. The first approach was to select a discarded material or object that showed some potential and then determine what applications it could be suitable for. The plastic chandelier is an example of this approach where the plastic PET bottles were readily available and a unique adaptation of the bottles was later conceived. The second approach consists of having an application in mind and then seeking out materials that would be suitable to experiment with. All of the projects relating to seating - the skateboard stool, billboard bench, and tire cushions - fall under this second approach.

Both approaches allowed for a great deal of creative intuition and a playful, experimental design process. It was discovered that the first approach could have endless possibilities, limited only by the material's limitations and the designer's imagination. The second approach contains one set of variables, the application, but is limited only by the types of salvaged materials that can be found. One approach is not necessarily better then the other. It is completely dependant on the project at hand and/or the designers choice as to which approach would be most appropriate in each case.

Educating the Public

Education was a tool used throughout this thesis with the goal of reaching the public at large. It was used throughout the book by bringing forth an investigation of certain significant cultural issues that influence our lives, by providing step by step instructions on how to make particular projects, and finally as an exhibition to provoke the public and teach by example.

Two distinct methodologies that are available to an educator were used to educate the public. The first was a hands-on approach that instigated learning by doing through workshops such as the one give at the 2009 World Environmental Education Congress that I attended this year. The second methodology stimulated learning by example through a compilation of work in a gallery exhibition. Both methods are effective in their own way. I believe that there is more value in teaching someone how to accomplish a task because that person can then walk away with a new skill or tool that can be implemented in future endeavours. However, by having an exhibition that teaches by example, it reaches a wider audience of people who are drawn by exhibitions, who have good intentions but are not as handy as others and are simply content with the exposure of new ideas.

Provocation was used to intrigue a wider audience in the hopes of reaching those who are naive or ignorant to important environmental issues. By making people aware and provoking their thoughts on the problem of waste, they may be more inclined to reuse or readapt their waste. This would therefore reduce the garbage sent to

landfill sites by delaying their disposal, in some cases indefinitely, by giving these waste materials a second life.

The Role of Design

In our consumerist society where industries and corporations seem to set the standard for how things are produced, it is the hope of this work to reach the consumer so that they can create the demand for better quality, safer products. However, where this approach falls short is in the role that design can play that can further influence these corporations to change their ways towards more resilient and sustainable practices.

Design can reinterpret a whole production process from beginning to end so that instead of polluting the water source it actually cleans it. Currently, there is a possibility to do this but only in the rarest of cases. Design can be used from the beginning conception of a product to design it to be recyclable, reusable or used as a desirable raw material for other production processes. Through reinterpretation or redesign, it can be used to find a solution to the problem or task at hand rather than creating a new product in the first place. By using design in this way, a lot of our unwanted waste could be alleviated. It could even prove to be more economical then conventional means of production. Ideally, industrialization would be driven by an economy that puts our health, our survival and our environment first by acknowledging their worth rather than sacrificing everything for the bottom line. Fortunately, the tides of industry are beginning to change. Consumers are increasingly demanding more environmentally friendly, durable products. As a response to this demand and our environmental predicament, more corporations are beginning to see the benefits of redesigning their industrial practices. Companies such as Ford Motors, Herman Miller furniture company, Interface carpet company, Walmart, Mountain Equipment Coop are leading this trend.

Where design is not or cannot be implemented at the beginning of the process, it can be instrumental in dealing with the surplus waste of production. Seeing that it will be some time until value is given to design so that it is seen as an essential tool, this work has set out to respond to the aftermath of consumption. It is intended to be used as a step towards minimizing the impact of surplus waste while advocating the importance of design to solve some of our pressing environmental problems.

The Question of Style

The question of style is directly related to the importance of education, and the role of the designer as outlined in this work. It is worth reflecting on this since they are the tools instrumental in conveying the message of the design projects. Style changes with the latest trends of the time and can easily influence the value that is placed on a product. While it is currently very marketable to label an item "green", it should not take away from the intention to strive for good design. The projects herein are responses to sustainable design as it provides challenges that lead to the creation of a new form. Even so, the design projects were created without any distinction between this new form of sustainable design and the traditional sense of sound design.

By its nature, the role of style cannot be escaped by a designer. These works do strive for a timeless sense of style that is aesthetically both raw in their material origins and elegant in their form and function. However, the importance does not lay with the style of the pieces but in the message that they convey. The goal was to challenge the design system by elevating the status of discarded material in a provocative way with the intention of making people reconsider the world around them. This is what gives substance to style and partially to its aesthetic appeal.

Reflections on Sustainability

Each project has extended the life of the material it once was. This was accomplished to varying degrees of success. Using this criteria the Skateboard Stool can be seen to be the least successful. It has a limited use and target market therefore it may not be an item kept for a long time unless it is seen as a cherished piece of art. Furthermore, it cannot be recycled and because of the adhesives used to laminate the deck, it is not recommend as a burning fuel. With the exception of the Billboard Bench, the other projects have the ability to be recycled when and if they are discarded or re-adapted. The projects made from the plastic bottles or containers as well as the Tire Cushions all have potential afterlife. The Tire Cushions have proven to be quite durable. The tires will last indefinitely until recycled or reused while the rope may have to be replaced at some point. There is potential to recycle the nylon rope while the jute rope will biodegrade. Finally, the Billboard Bench has proven to have the best potential to have the longest life. It is a multi-functional piece and can be even more so if the proportions are manipulated. It is an incredibly durable and solid bench. Its style is simple and timeless so that it can endure the changing fads. Ultimately, it is this durability and adaptability that makes for a more successful project.

People are more inclined to keep pieces that are durable and timeless. This above all the other sustainability criteria will make a more successful project because of the nature of the exercise. Salvaged materials inherently have unsustainable practices attached to them. While the recreation of a new design can follow the prescribed criteria mentioned earlier in the book, what will inevitably keep if from landfill sites will be length of its life cycle.

The designs presented in this thesis address the question of sustainability in the following ways. Energy consumption is reduced by minimizing the energy used to reinterpret the materials into its new form and function. The distance travelled by materials or finished products is reduced by sourcing local salvaged materials and constructing them in a local workshop. The usage of renewable materials has clearly been central to this thesis. The challenges related to the usage of renewable energy sources, however have been seen as being beyond the scope of this study. The need to advocate for socially responsible practices has similarly been left out of this study. The concern for human health in the manufacturing and usage of products has been given close consideration. Ultimately the need to assess and reduce the impact that manufactured products have on

the environment has been a central principle.

Concluding Thoughts

The more one learns about our current environmental predicament, the easier it is to become quite sceptical about our future generations and the planet's future, even to the point of paralysing futility. Understandably so, our planet has been greatly impacted by our actions in such a short amount of time. The intentions of this proposal were to mobilize the paralysis and tame the inner sceptic by starting somewhere, by provoking new ideas, by shaking off social prejudices and by educating the public.
This dissertation has attempted to connect with people on a personal and positive level by using play and experimentation of objects that are easy to connect with. It is done so in the hopes that the public will relate to environmental ideas more easily without attempting to guilt them into action. Instead, it is a way of creating awareness, to encourage thinking on a deeper more profound level; at a level that connects with a collective unconscious and our deep routed value system. The design and how it reflects our values must be addressed. On the other hand, we need to evolve our values so that we can perceive products in a different light.

When is enough, enough?

I do not believe that design experiments such as these will end in the near future. As long as there are discarded items, surplus material, misprints and a lack of total environmentally friendly industrialization, there will be a need to innovate in hopes of keeping precious natural resources from landfill sites.

I perceive it as a work in progress. The purpose is to establish a stepping-stone towards better solutions and heightened awareness. If we reach a point in our civilization where our endeavours have significantly less impact on the planet, this approach to design must continue to ensure our resilience to change.

This thesis is a montage of possible design avenues one can take to address the questions it has raised but more importantly to devise a set of innovative strategies that will improve our resilience. It is not aiming to resolve the present environmental predicament but to hold the theories discussed in tension. It is the objective of this thesis to use this tension to propel forward these ideas and issues. This work has strived to aid the reader/user to comprehend environmental issues by making things tangible and real. The underlying motto for this work is to start small and think big.

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