An Exploration of Materials and Details

The Need:

With the advance of society, box stores are becoming the most common resource for private homeowners to purchase landscape fixtures such as benches, tables, arbors, and much more. These elements are mass-produced and retained no originality. Patio furniture has been taking on a similar appearance from one back yard to the next.

As a private homeowner in the Des Moines area, there are limited options for landscape elements. If you would like a metal bench, arbor, or table, you resort to buying a pre-fabricated one form a box-store. Wooden elements allow for more originality since skilled craftsman are more readily found. Metal smiths and fabricators are harder to come by. The ones that are commonly found do not build landscape elements. Instead, these fabricators will modify trailers, tractor attachments, and similar items. There are still modern day blacksmiths who will make custom rails, benches, and other elements, but there is a high price that comes with the technique.

The Solution:

While exploring the relationship between different materials and the connections between wood and metal, I will construct custom benches, signs, tables, green walls, and other landscape elements desired by clients. Elements will be made and ready for purchase or a customer can work with me to modify an element to fit their location. Planters will be included on various elements to provide customers the ability to blend the element into their current landscape, project, or patio.

Metal elements will be assembled with a variety of construction techniques to add appeal and texture. Some elements will be bolted/screwed together while others may be welded together. Welding can add a very interesting texture and appearance due to the different types of welds. To achieve certain looks, a combination of techniques will be used. Different elements will be constructed in such a way the customer has the ability to take the unit apart for transportation or storage.

Elements may be painted or left bare to reveal the process that took place during construction. Welding superheats the metal to fuse the different pieces together. When the metal cools there is a blue hue left radiating out from the weld. Other elements may be left bare to allow the customer to impart whatever design they desire. Wooden elements may be stained and varnished to accentuate the grain of the wood, or painted by brush, leaving brush strokes behind. A rustic appearance can be added to both the metal and wood by layering paint colors and sanding areas to reveal the bottom color.

The hope is as neighbors bring home unique elements, people will be inspired to take back their yards, patios, and porches, impart some of their personality, and create unique, interesting spaces. Valuing the process that went into the creation of the elements will return to the process of buying items.
The Drive:

While growing up I watched my father spend many hours working for others until he resigned and started his own business. At the time I was only twelve years old and did not understand why. Now, as I have progressed through my education and am on the verge of graduating I understand why my dad took the risk and started his own business. He knew what he was passionate about and wanted to pursue his passion after working for many years. I have held many conversations with my dad about the process and reasoning and have been inspired to take the risk, start my own business, and develop recognition for my efforts.

As a designer it is very hard to work under another fabricator and have your style and ideas take shape how you envisioned them. You have to conform to the company’s standards and lose some of your individuality. I am seeking an environment that allows me to explore my interests in construction practices and materiality that is not limited by others. I understand the difficulties of starting a business, the paperwork, permitting, registration, and many other elements, but I am will and motivate to learn how to accomplish all of this. I am willing to fail and learn from it to better the business. I believe in the saying that without risk there is no reward. I am not seeking to simply build furniture for people who are tired of box stores, but to change the way homeowners see site elements. It is my desire to start revealing to people how a simple connection technique can drastically change an element. These small details matter, deserve attention, and can change your perception on what you really see when you look at a site element.

To put it plainly, I am going to start up a business that doesn’t lose sight of who has determined the success of the business. The environment of the business will be one where clients feel valued and respected. I will make sure I am available to clients even after the sale. While working at Brown Equipment I found out that when you provide support above and beyond what customers expected before and after a sale, you get their business for life. Spending time talking to the potential client about what they are looking for and even topics outside of the business will make the difference between them spending more money for a better product versus going to a box store. People value the service one can provide and are often willing to pay more for it. These beliefs and ethics are what my business will be based off. This understanding, drive, and my determination are why you should invest in me and fund my proposal. I have learned from my previous experiences and will continue to learn. A rigid business may be successful for a brief period of time, but it is not one that will grow and continue to thrive.

The Value:

Custom design is often known for having a higher degree of value placed on it. The value I am referring to is not monetary, all though in many cases it certainly applies. Value in this sense is what custom design brings clients. To start off with, custom design is known for its higher level of quality than can be found in box stores. For example, in custom benches, the wood used is sized to last more than 5 years outside. Custom designers want clients to buy more elements, but not because an old one broke. Custom designed elements are not
“throw away” elements. Personalization is a value that is also supplied to clients with custom design. You are getting a product that completely fits what you were looking for instead of compromising for something that might only meet part of what was desired.

Personalization in terms of value does not equate to the color or finish of piece. The value extends to having the element scaled to fit its location or users. Not every person is the same height. Note every family consists of two, four, or six people, the common sizes for box-store tables. The last portion of personalization I would like to shed light on is the site. Every site is different and in landscape it is not a one size fits all approach. Why then should homeowners be forced to purchase a bench that all of their neighbors have because it is one of three offered? This bench may not even fit the site. Custom design will allow the element to flow with the location it will be placed in.

As a designer I feel it is my responsibility to empower my clients to be able to make educated decisions in the future. Even if a client does not purchase anything, providing them with the knowledge to pick a product based on the details and construction as well as aesthetics is a value you cannot place a price on. This is the most important value provided by custom design in any field.

The Means:

With a scholarship amount of $5000 I will be enabled to pursue an enlightening experience and business startup through the purchasing of equipment and materials. I will provide additional funding to supplement the opportunity. Once I am able to start constructing elements, Brown Equipment will allow me to display my work around its store.

Target Customers:

To start of with, I will focus on local residents and businesses. As an emerging business it is often easier to communicate with smaller entities and get a footing. To help further the business and provide a foundation for the startup I will reach out to Landscape Architecture companies and local municipalities. Through these I hope to obtain larger, long-lasting clients to provide stability to the business.

Goals and Objectives:

- Establish an Understanding of Planters/Green Wall Systems
- Explore and Understand Relations Between Different Materials
- Explore Aesthetic Appearance of Different Welds and Joint Options
- Build Preliminary Elements For Display and Sale
- Start Establishing Name Recognition for Quality Work
- Establish Lasting Clients and a Lucrative Business.

Time Line:

- Research Planter Construction Methods       Spring 2015
- Locate and Contact Local Material Handlers  Spring 2015
Plan of Action:

When designing site elements many factors need to be taken into consideration. Is the element going to be sitting outside with no shelter? Will the sun and rain be hitting it? Will it be taking in during winter? Many of these questions won’t be answered as I design and build the site elements. Unless a client tells me otherwise, I will design and build all of my elements for the worst conditions, meaning the elements will be designed to take the rain, sun, and winter months. To accomplish this all wood will have a durable varnish layer applied and a waterproof coating. Any metal will be painted or chromed, preventing oxidation and rusting. When designing different elements the process will vary slightly. All in all, I am striving to produce quality elements that will help to establish a respectable business name for quality work, design flexibility, and respect for clients, representatives, and suppliers.

1. Green Walls

When designing green walls, the location will be critical in the design. The location will determine which plants to select, the size of the green wall, and if it is free standing or wall mounted. Construction materials may also change based on the size. As a green wall gets larger, it will be holding more soil. Metal is a stronger material than wood, requiring it to be used on larger green walls. Another element of green walls that could complicate designs is whether the wall is irrigated or needs to be watered by hand. The practicality of watering the green wall by hand lessens as a green wall grows in size. Since I am proposing using removable trays to quickly change the appearance of a green wall, hand watering will be required.

2. Benches

From a business standpoint benches will be one of the largest components. Proper design considerations need to be explored. During the design and construction of benches, I will use *Time Saver Standards for Landscape Architects* to ensure I meet the standard height, width, and load bearing capabilities of my pre-constructed elements for customers to buy. When a customer wishes for a custom made bench, I will work with them to develop the concept, but overall this business venture is to allow me to design and construct elements. The actual design and detailing will be done by me and constructed after approval by the client.

3. Tables

Tables are similar to benches, as they will be one of the largest portions of the business. You can easily take a one size fits all approach and make all your designs...
the same size, or you can vary different aspects. A larger family may require a longer table where as a couple may desire a small, intimate table. To accommodate this, I will design and build one standard sized table as an example of the material finishes. If someone wants to buy the table I will sell it and make another. Most of the tables I will build will be built after a client has expressed their needs to ensure proper design and detailing.

4. Signs

Many businesses rely on signage for wayfinding. Signage is an area that will be hardest to work in. Since I do not have a CDC machine, a computer controlled cutter, I will be required to make wooden mock ups of signs, clamp the wooden mock up to the metal, and then run a hand-held plasma cutter along the wood. By working by hand I will not have a size restriction other than the size I can buy sheet metal. When working with a business I will need the business to supply me with an image of the logo or sign they wish to have made. For most residential clients I will be able to work with them to generate their sign. After working through the details, I will meet with the client for approval.

5. Planters

Planters or flowerbeds are now being used in many ways. They may contain flowers, as is tradition, or now you may see a small food garden planted in one. Regardless of the application, the construction follows the same basic guidelines. What can differ is the size of the planter and its’ appearance. To let clients know I make planters I will make a couple small planters. They will serve as demonstrators of what you can do to a planter to personalize it. This includes attaching built in storage for you gardening tools, encouraging families to let their kids paint it for them, using different materials, and planting different plants.

Budget:

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbara King Scholarship</td>
<td>$5000</td>
</tr>
<tr>
<td>o Welder (Power MIG 350MP)</td>
<td>$3500</td>
</tr>
<tr>
<td>o Drill</td>
<td>$150</td>
</tr>
<tr>
<td>o Grinder</td>
<td>$130</td>
</tr>
<tr>
<td>o Deep Cut Band Saw</td>
<td>$300</td>
</tr>
<tr>
<td>o 14” Abrasive Cutoff Saw</td>
<td>$160</td>
</tr>
<tr>
<td>o Materials (Metal, Wood, etc.)</td>
<td>$760</td>
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</tbody>
</table>

- Metal and Wood cannot be priced out to exact amounts.
  Metal is sold by the price per pound. The price per pound varies based on the type of metal, forming process, and form of the metal.
  Wood is priced based on its size, quality, type, and characteristics.
<table>
<thead>
<tr>
<th>Equipment</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Contribution (Equipment)</td>
<td>$7000</td>
</tr>
<tr>
<td>o Welder (Power MIG 350MP)</td>
<td>$3000</td>
</tr>
<tr>
<td>o Sheet Metal Shear/Press</td>
<td>$450</td>
</tr>
<tr>
<td>o 20 Ton Press</td>
<td>$150</td>
</tr>
<tr>
<td>o Torch and Gases</td>
<td>$500</td>
</tr>
<tr>
<td>o Plasma Cutter</td>
<td>$700</td>
</tr>
<tr>
<td>o Forklift</td>
<td>$1500</td>
</tr>
<tr>
<td>o Table Saw</td>
<td>$150</td>
</tr>
<tr>
<td>o Radial Arm Saw</td>
<td>$150</td>
</tr>
<tr>
<td>o Wood Band Saw</td>
<td>$200</td>
</tr>
<tr>
<td>o Drill Bits (Wood/Metal Rated)</td>
<td>$70</td>
</tr>
<tr>
<td>o Hammers</td>
<td>$50</td>
</tr>
<tr>
<td>o Chisels and Punches</td>
<td>$80</td>
</tr>
<tr>
<td><strong>Total Startup Budget</strong></td>
<td><strong>$12000</strong></td>
</tr>
<tr>
<td>o Further Personal Contribution will be added as needed</td>
<td></td>
</tr>
<tr>
<td>o Due to the high cost of the welder, I will provide approximately half of the funding personally.</td>
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</tbody>
</table>

A minimum amount needed for the business start up would be $3000. This would shift the budget in a number of ways.

- The Power MIG 350MP will be replaced with the Power MIG 256. This switch will reduce the price of the welder to $2500, but further purchase will be required. A Magnum 250LX Spool Gun costing $1500 will be required as well as the wire. The price of the welder would then be $4000.
- Personal Contribution would change to $10,660.
  - The radial arm saw, wood band saw, and table saw will be removed, eliminating $500, gearing the startup towards metal work.
  - The personal contribution towards the welder is reduced to $2000.
  - The 14” Abrasive Cutoff Saw would be shifted to the personal contributions, equaling $160.
- The $3000 would be broken out as follows:
  - $2000 Welder and Spool gun (Remainder Personally Funded)
  - $600 Drill, Band Saw, and Grinder
  - $400 Materials (Requires Further Personal Contribution)

**Equipment:**

- **Welder:** Lincoln Electric Power MIG 350MP
  - The 350MP is a multi-process welder, allowing me to work with different metals including aluminum, steel, stainless steel, and cast iron, while also use one machine to perform different welding processes. These processes include Metal Inert Gas (MIG or also called Metal Active Gas, MAG, or Gas-Shielded Metal Arc Welding, GMAW), Pulse MIG, Stick
Welding, Tungsten Inert Gas Welding (TIG), Flux Cored, and Pulse-on-Pulse.

- After pricing out the option of buying a Spool Gun to allow for aluminum welding, averaging around $1500, it is cost intuitive to purchase the Aluminum Manufacturing 350MP, which includes a Push-Pull Gun, and a 16 lbs. pound spool of aluminum wire. The Push-Pull Gun and spool of aluminum wire would cost over $3000 dollars by themselves. By purchasing the Aluminum Manufacturing 350MP I will be saving over $1000.

Drill:
- Drills have the capability to preform many tasks. Put in a multi-purpose bit and you have the ability to put a hole in wood and most metals. If you attach a wire wheel the drill becomes a buffer to remove foreign material from a surface.

Grinder:
- After cutting metal there are often sharp edges left. The grinder uses an abrasive wheel to smooth out the surface. The same wheel is used to grind down welds, creating smooth joints/seems.

Deep Cut Band Saw:
- This tool will allow me to make precise cuts at different angles and cut through medium-thickness metals. It is more accurate than a plasma cutter and quicker for smaller cuts. It has a limited capacity of 5” deep. The band saw is often used to cut tube, channel, square, rod, and angle iron.

14” Abrasive Cutoff Wheel:
- An abrasive cutoff wheel is used to make multiple cuts of the same length through tube, channel, square, rod, and angle iron. There is a clamp attached to the base of the unit fixing the material being cut in place, restricting all movement, ensuring a proper cut with proper measurements. The angle of the cutoff wheel can be changed to cut at different angles to create many pieces with the same cut. This ensures pieces will line up correctly upon assembly.

Sheet Metal Shear/Press:
- This tool will allow me to form metal to precise angles and also make precision cuts that are both straight and clean.

20 Ton Press:
- This press will allow me to further shape metal that would normally take hours by hand or require large amounts of heat. In other words it allows me to Cold Form metal.

Torch and Gases:
- The ability to apply heat will allow metal to be easily manipulated into new shapes. At the same time I can use the torch to add different visual appearance to material. Having a torch will enable me to form pieces together through a process called Brazing as well. A common method used in the construction of bicycles.
Plasma Cutter:
  o With the capability of cutting through ½” steel plating, the plasma cutter will enable me to quickly and cleanly cut out metal designs and structure pieces with a minimal amount of wasted metal.

Forklift:
  o Metal will be delivered truck freight through Fort Dodge Steel. Due to the weight, unloading by hand will not be practical. Loading completed elements into vehicles will be easier with a forklift as well. It will help prevent injuries from lifting. The forklift will be used with pneumatic tires meant to operate outdoors. It will have a lift capacity of 2000 lbs. and a lift height of 12 feet.

Radial Arm Saw, Wood Band Saw, Table Saw:
  o These various saws will be used in the construction of different site elements when wood is involved. Each saw performs a unique cutting technique that lends well to the construction of landscape elements.

Drill Bits, Hammers, Chisels, Punches:
  o Any manufacturing process will require the use of these most basic tools.

Evaluation of Start-up:

After I have completed the construction of various design elements and had them displayed at the local lawn and garden equipment store, Brown Equipment, I will be able to evaluate which elements were successful. If I was not making an element that clients wanted, I would have found out through my conversations with them and if demand was high enough, start making pre-constructed versions for customers to walk in and buy. I will keep records of what sold and when it sold. When reviewing these documents I will be able to determine any patterns and notice when one item sells best. This will enable me to become more efficient and make products when they are desired instead of tying up my display area with items that aren’t desired at that time. Businesses tend to have slow periods when its’ products are not in season. Monitoring my sales will identify my business’s slow period. From there I will be able to add incentives to generate business and keep me busy year round.

Dissemination Plan:

At Iowa State University there is a club called the Student Society of Landscape Architecture or SSLA. As the name suggests the SSLA is comprised of students ranging from second year all the way up to fifth year Landscape Architecture majors. Every year the Barbara King scholarship is explained to these students but vary few strive for it. During the presentations I attended, student work was not displayed. The entire presentation only amounted to a university official reading off the requirements and names some past projects. I will document my work and create a presentation for SSLA and other ISU professors to show to students. Included in the presentation will be the challenges I overcame and how I overcame them, the successes and any advice I have to pass on. Hopefully seeing a project from start to finish will inspire other Landscape Architecture students to pursue the Barbara King Scholarship.
Prospective Business Plan:

Based on the success or failure experienced during the start-up, I will develop and amend my business plan. Every potential customer is a learning experience to better the business and myself. When a customer passes on an element, it is an opportunity for improvement. When a customer buys an element it is an opportunity to determine what was successful and further it. Ultimately the goal of this endeavor is to become self-employed and not require additional support from a second job.

My Interest:

Through my studies of Landscape Architecture at Iowa State University I have developed an interest to work with metal, explore its capabilities and the appearance when used with different materials. The specific combination of wood and metal has attracted the majority of my attention until the last year. Recently I have been researching small indoor green walls and am intrigued by them. With the scholarship I hope to inquire the use of metal and wood together to form green walls that can be used indoor and out. The indoor green walls I have been researching are not elaborate, irrigated systems. Simply put they are commonly plastic trays mounted vertical with a retaining material to hold the plants and soil in. This allows the owner to change out the plants and alter the appearance easily to change the aesthetics of the space.

My Experience:

During my fourth year at Iowa State University I underwent an independent study at Brown Equipment, a farm and garden equipment and repair shop. Here I learned how a business operates from bookkeeping, inventory management, customer relations all the way to repairs on equipment. I learned many valuable business skills and gained many professional connections. One of the most important professional connections I made was with Brad Brown, the owner of Brown Equipment. It is through this connection I was able to work with Mr. Brown to obtain permission to use an outbuilding to construct my design elements and display them in the showroom.

For years before my internship I have been working on tractor and other mechanical items, learning how they are constructed and work. During my explorations I came across many different ways of connecting materials including bolting, screwing, riveting, welding, tabs, and press-fit. I have noticed how each method adds a unique appearance and application. I learned how to weld and when to use different welding techniques. For some of the tractors I worked on I would patch loaders or even fabricate attachments for the 3-point. During my time fabricating different attachments I have learned the limitations of different materials, when to use different forms of metal, and the importance of proper connections.

My grandpa was a wood craftsman who built many different millwork elements. I have worked with my grandpa on many projects and learned many of the techniques of wood construction. I learned when and how to use each tool and the best way to form joints based on the application and material. On certain projects you do not want your connecting
material to be visible. There are many techniques to cover up nail heads, screw heads, and bolt heads. Knowing how to do many of these techniques will serve me well to create different appearances as I construct different landscape elements.

Anticipated Outcome:

Being able to customize landscape elements for clients and working directly with them will help to distinguish my practice from the box stores. I can provide a much more intimate level of service and will value clients requests. It is these characteristics that will allow my start up to thrive. Basing my work out of Brown Equipment will also benefit me since the business already has an established customer base consisting of many design build individuals, municipalities, and routine customers. Brown Equipment is located a couple miles south of Des Moines, a thriving city with many new housing developments showing up. Over time I see my work bring in customers to Brown Equipment, just as it will certainly do for me as my business starts up.