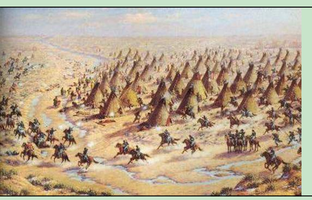
Studio 8 Tarpee

Benjamin Schuebel

“New oil pipelines in northern Minnesota would violate the treaty rights of the Anishinaabeg by endangering critical natural and cultural resources in the 1842, 1854, and 1855 treaty areas. All pipelines leak, and catastrophes like Enbridge’s 1 million gallon spill in 2010 on the Kalamazoo River are not unlikely. Pipelines threaten the culture, way of life, and physical survival of the Ojibwe people. Where there is wild rice, there are Anishinaabeg, and where there are Anishinaabeg, there is wild rice. It is our sacred food. Without it we will die. It’s that simple.”

Research

History



Native resistance in America has been ongoing since 1492

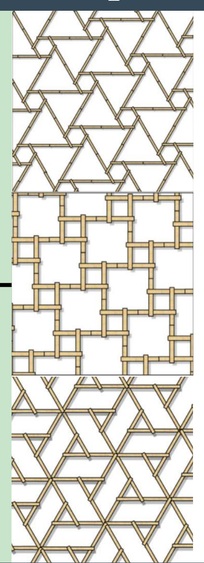
1963 was construction of the original Line 3 pipeline. In 1991, largest inland oil spill occurs in grand rapids.

Paul Cheyok'ten Wagner is the inventor of the Tarpee (a low budget contemporary teepee) 2016

Treaty of Paris 1763

Native American Self-determination/ Self-governance Era 1968-Present

Reciprocal Structures



A reciprical structure is a frame that is self supported by its own members and uses no adhesives.

The Teepee is one of the oldest designs of reciprial structures found as early as the 17th century.

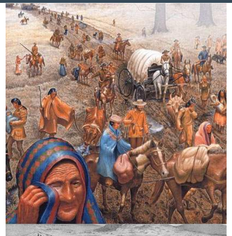
The current tarpee is not a reciprocal structure, in order to make it more portable

Line 3

In 1963, construction of original Line 3 pipeline began. Built by Enbridge, it became operational in 1968. In 1991 the largest inland oil spill to ever occur happened in Grand Rapids, MN. 1.7 million gallons spilled before it was fixed. Enbridge was responsible for this spill. In October 2021 Enbridge's new addition to Line 3 began operating after a long fight to #StopLine3.

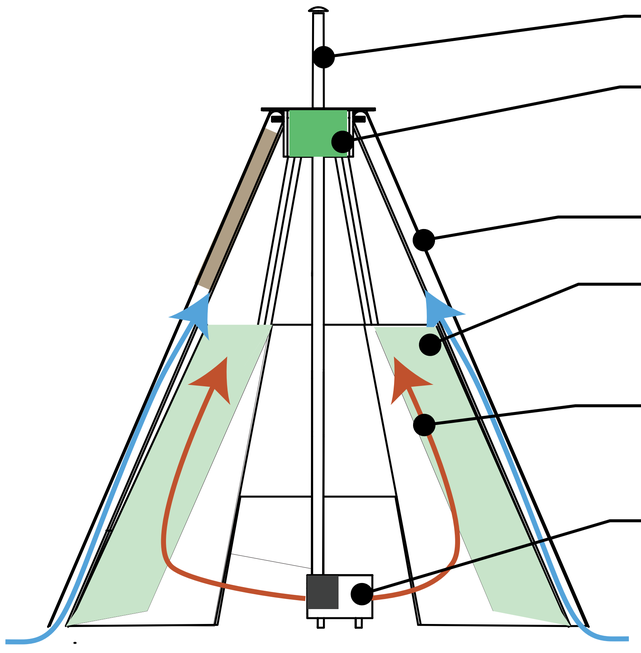
ENBRIDGE

Indigenous Resistance



The Tribal independance era came to an end in 1491. Colonialism started a long steming history of massacres and broken treaties. In 1700-1799 Native tribes form strategic alliances amidst international battles on their lands, while facing enslavement and continued land dispossession. Today, Indigenous are still resisting the many broken systems.

Existing Tarpee



Smoke stack offering exhaust from fire

PVC pipe as main structural member
Symbolism: Circle PVC is to represent the circle of live

Tarpee cover made of 2 layers of tarp

Tarpee lining to allow ventilation and seperation from the cold air

Tarpees can house up to 6 or 7 while fitting up to 15 people standing or keeping warm

Stove creates heat for the tarpee and offers an easy way to cook food

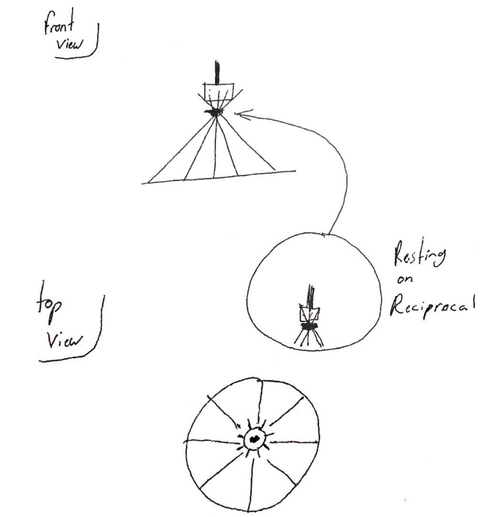
Paul Cheyok'ten Wagner, a Native American from the Saanich First Nations of Vancouver Island, is the inventor of what has been coined the "tarpee," a low budget portable contemporary teepee made from heavy duty polyethylene tarp and 7 16-foot 2x4 legs.

Process Work & Prototype Development

General Sketch Considerations

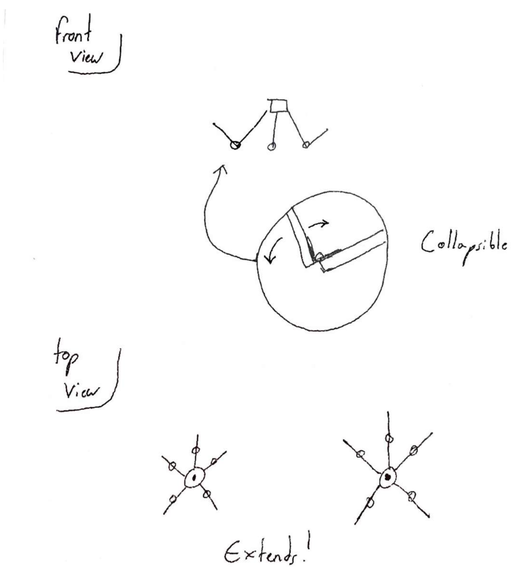
Reciprocal

Pictured: Conceptualizing a reciprocal structure with a top component that allows the user to stand on top of it.



Collapsable

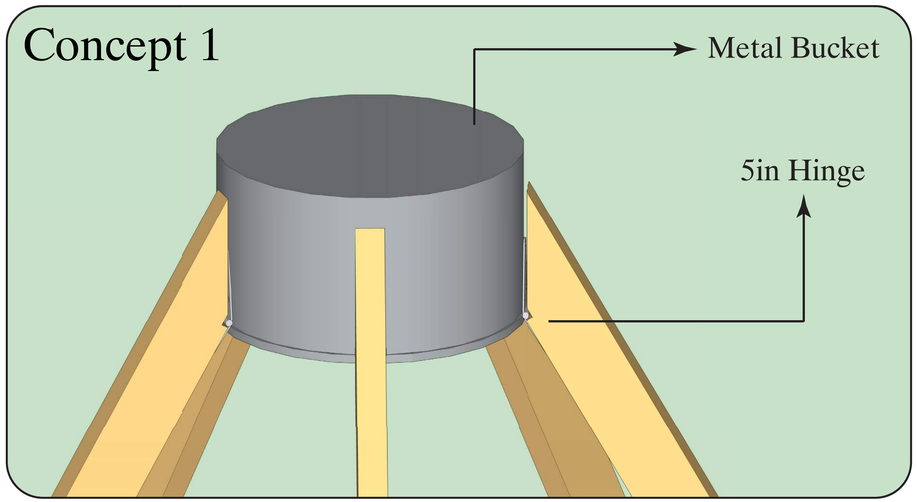
Pictured: Sketches considering ideas of folding collapsable legs, to allow for easier portability.

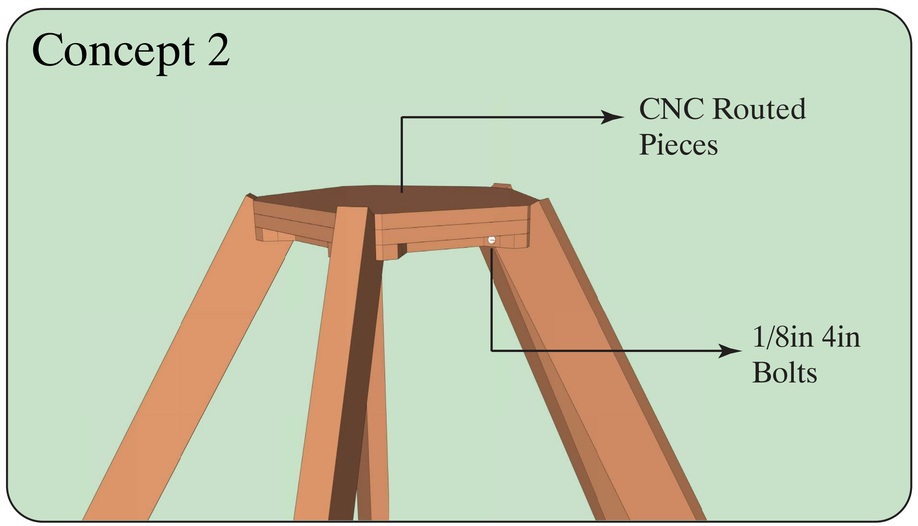


Takeaways

- Design should consist of members which can fold up for easy portability of structure
- Materials should be extremely accessible
- Constructing and setting up structure should be simple
- Shelter should be structurally sound

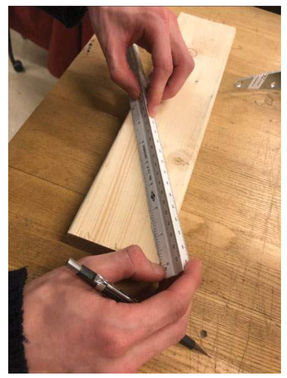
Revised Concepts

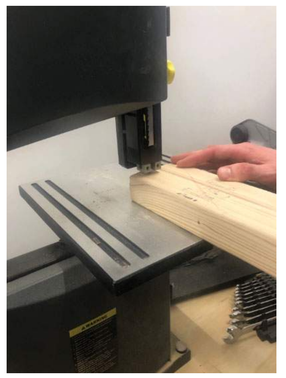




Concept 1

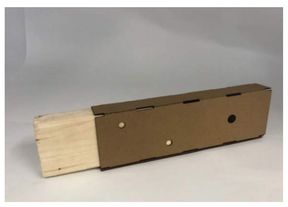
This concept focused on total acessability. It was constructed entirely with off the shelf materials commnly found in hardware stores.





Concept 2

Concept 2 focuses on simple assembly with CNC routed and plasma cut peices with some off the shelf hardware like bolts and nuts serving as rotating leg components.

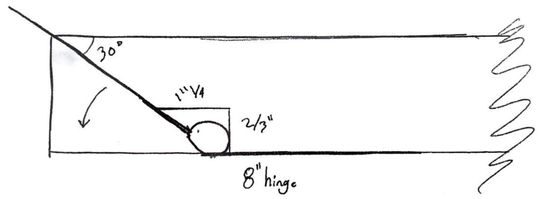


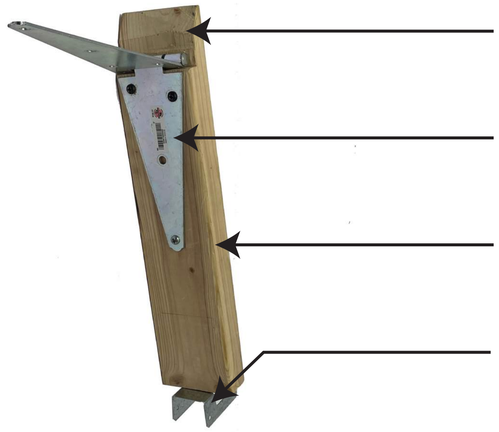
Within this process work, more effective innovations as far as hardware and top components arose. This sparked a few very differnt concepts throughout the process.

Initial Prototypes and Fabrication

Prototype Progress

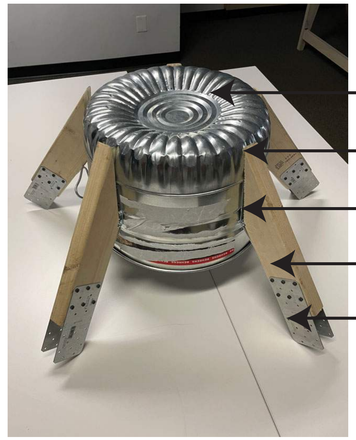
Prior to prototype 1, the legs were rotated horizontally to experiment with larger strap hinges. This design was quickly phased out due to connecting it to the 16 foot leg members.

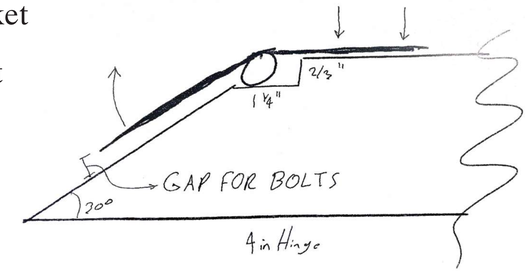




Prototype 1

Prototype 1 brings similar elements from initial progress. In this version we decided to rotate the legs vertical rather than the previous horizontal attempt. This made for a need for smaller hinges. While the design worked well, the specific bucket may not be accessible on a national scale.





Store Bought Materials

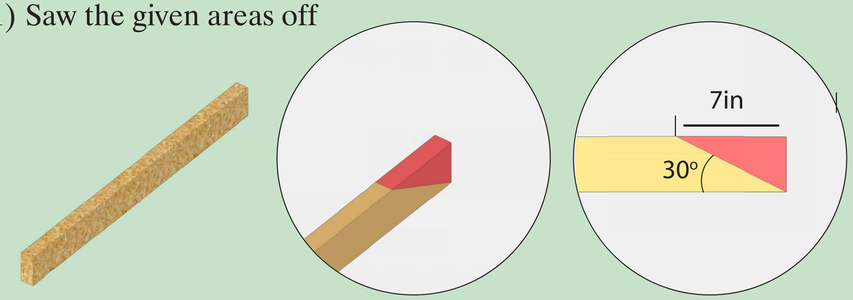
Fabrication

Leg Assembly

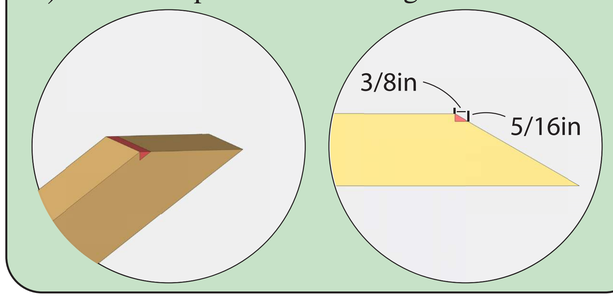
Tools Needed:

- Saw
- Crank wrench
- Drill

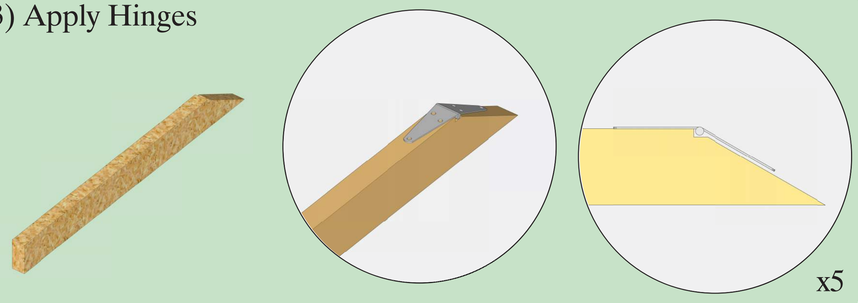
1) Saw the given areas off



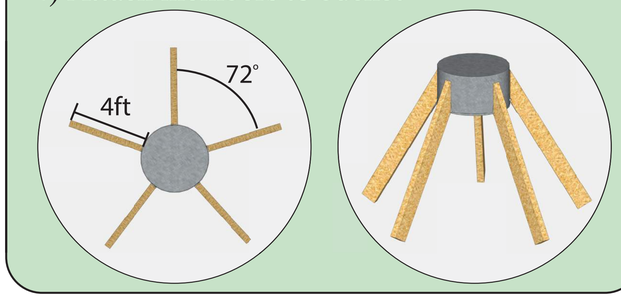
2) Cut extra piece out for hinge



3) Apply Hinges



4) Attach members to bucket



Cost Analysis

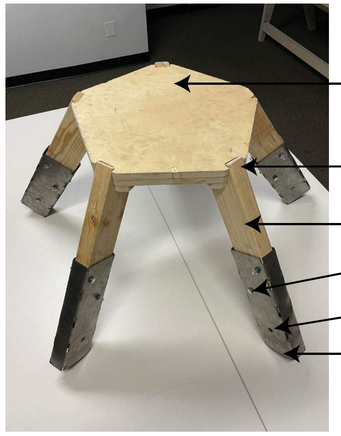
Behrens 1 Bushel Utility Basket	**x1**	**$20.03**
1in Dry Wall Screws	**x1**	**$5.33**
4in Zinc-Planted Heavy Hinge	**x5**	**$18.75**
2x4x8ft Whitewood Stud	**x10**	**$6.94**
Circulator Flange Nuts and Bolts	**x1**	**$17.44**
3x7in Tie Plate	**x4**	**$25.50**
2in x 4in x 16ft Spruce Lumber	**x5**	**$96.25**
Reused Billboard Vinyl 14’ x 48’	**x1**	**$75.57**

Total: $265.81

Final Prototypes

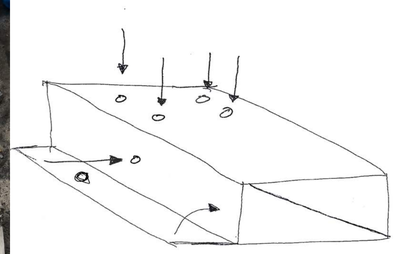
Prototype 2

Prototype 2 is made of CNC routed parts, therefor it is consistent assembly-wise every time. This design is much more structurally sound than Prototype 1. Combined with a new leg connecting piece protoype, this final design is incredibly simple to reuse, and very struturally sound.



Prototype 2.5

Made with a CNC plasma cutter, the leg connection prototype is consistant and easy to source from local metal cutting shops. It allows the 16 foot legs to simply be held in place by a pin. Thus after initial setup, the top piece never needs to be deconstructed,



Tools Needed

CNC Router

Drill

Crank Bolt Wrench

CNC Plasma Cutter

C Clamp

Sewing Machine

Sheet Metal Folding Machine (If Needed)

Miter Saw

Combined Prototype Materials

Store Bought

Concept 2 & 2.5 Combined Cost Analysis

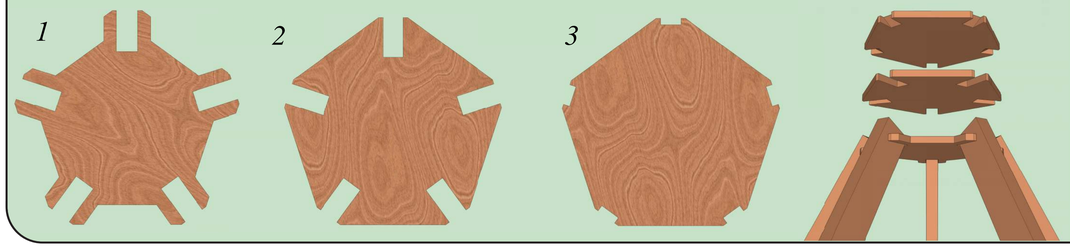
3/4 in. x 2 ft. x 4 ft. PureBond Red Oak Plywood Project Panel **$32.39**	**x1**	**$32.39**
M6-1.0 x 100 mm Phillips Pan Head Stainless Steel Machine Screw **$2.77**	**x5**	**$13.85**
M6-1.0 Zinc-Plated Steel Metric Hex Nuts (2 Pack) **$0.84**	**x3**	**$2.52**
2 in. x 4 in. x 16 ft. Appearance Grade Spruce Lumber **$19.25**	**x5**	**$96.25**
2 in. x 4 in. x 8 ft. Prime Whitewood Stud **$7.78**	**x1**	**$7.78**
8 oz. Wood Glue **$5.04**	**x1**	**$5.04**
1-5/8 in. Philips Bugle-Head Coarse Thread Sharp Point Screw Pack **$8.62**	**x1**	**$8.62**
12 in. x 12 in. 16-Gauge Weldable Sheet **$12.22**	**x5**	**$61.10**
3/8 in. x 2-1/2 in. Stainless Universal Clevis Pin **$9.12**	**x5**	**$45.60**
1/2 in. Zinc-Plated Hitch Pin Clip **$1.06**	**x5**	**$5.30**
5/16 in.-18 x 2 in. Zinc Plated Hex Bolt **$0.37**	**x10**	**$3.70**
5/16 in.-18 Stainless Steel Hex Nut Pack **$9.86**	**x1**	**$9.86**
5 ft. x 3/4 in. Sticky Back Tape **$8.62**	**x1**	**$8.62**
Reused Billboard Vinyl 14’ x 48’ **$75.57**	**x1**	**$75.57**
Fire Retardant Stove Jack **$14**	**x1**	**$14.00**

Total: $390.20

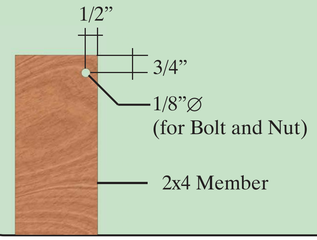
Fabrication Sheet

CNC Routed Component

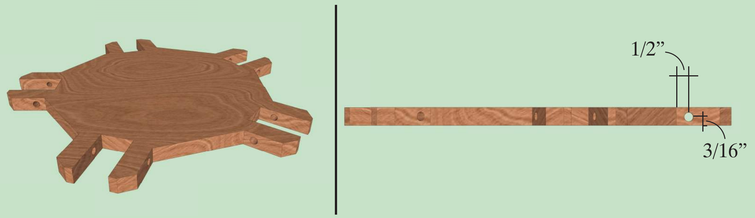
1) 3 Slab Approach



2) Member Dimensions

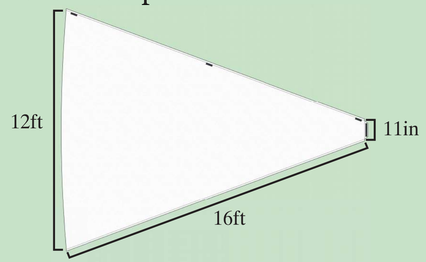


3) Slab *1* Hole dimensions

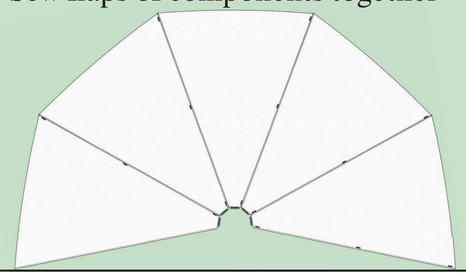


Tarp Component

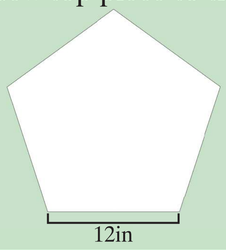
1) Cut each component out



2) Sew flaps of components together



3) Cut and sew top piece to the top

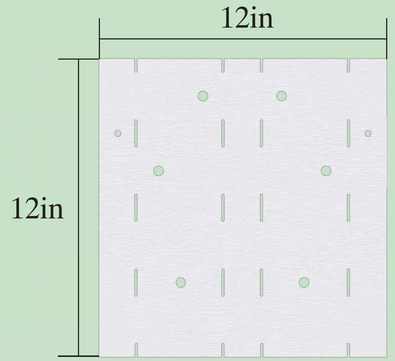


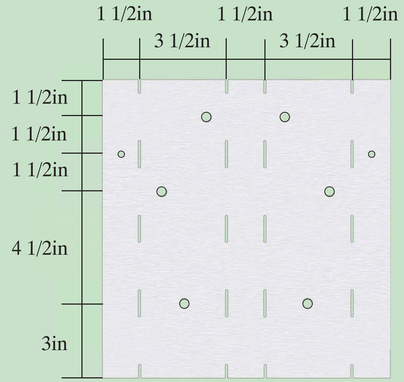
4) Sew Velcro strips to flaps

Total cost of Prototype 2: $264.64

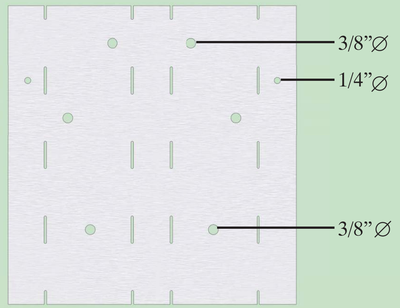
Plasma Cut Component

1) Dimensioning and Framework

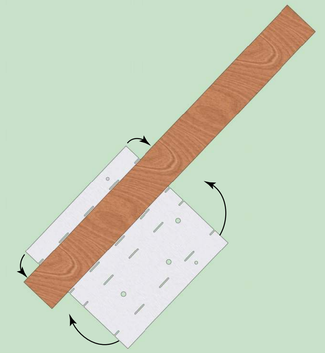




1) Dimensioning and Framework *cont.*



2) Bending and Attaching



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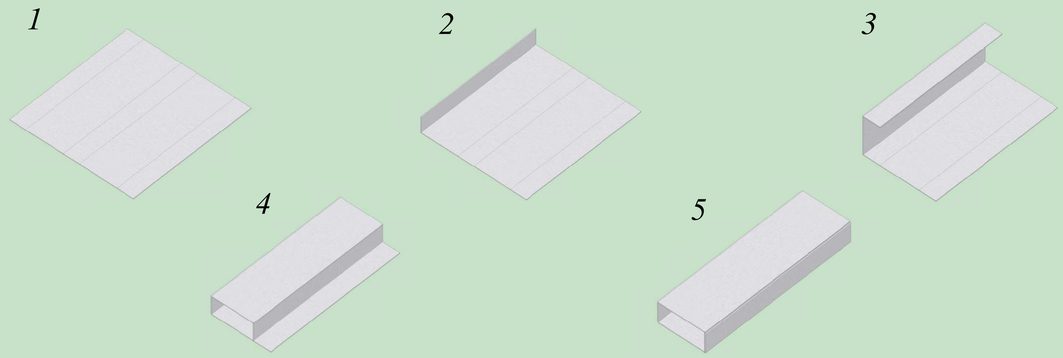

Total cost of Prototype 2.5: $125.56