Ramp:

For the ramp, the basic dimensions came from the scaled drawing we were provided. However, we shortened the height by a small amount so that we could fit the release mechanism on the top of the ramp. There are essentially two main assemblies that comprise the ramp: the ramp itself and the release mechanism. The ramp itself is primarily made from wood. Two pieces of plywood comprise the sides, while pieces of 2 x 4 hold these two sides together. We designed the two sides of the ramp to create a curve that was steep enough for the car to gain enough speed to reach the target, but also did not drive the car straight into the ground. We wanted the car to come out of the ramp as tangent as possible to the ground. To do this, we cut the end of the side off a little bit and allowed the top of the ramp to reach the ground without having any wood underneath. This allowed the ramp to meet the ground well under the .03 in step requirement. This also allowed for a fairly smooth transition from the ramp to the ground. The top of the ramp is made from a single sheet of galvanized steel. This piece of steel will be cut and molded to match the curve created by the two plywood sides and glued accordingly. We decided to use galvanized steel because it is cheap and easily moldable. It is also available in large quantities that would allow us to create the top from a single sheet of metal. We also decided to use a metal top in the first place because it is naturally smooth and can be molded to form a curve. The second assembly that makes up the ramp is the release mechanism. For our release mechanism, we have a hook like structure that is connected using dowels. This mechanism connects a hook to a lever using a dowel. The hook will be attached to back of the car and will pull up as someone pushes the lever on the dowel down. The mechanism will be mounted to the top of the ramp using pieces of 2 x 4 to act as supports. We decided on the hook design because it will add to a smooth release because every part of the hook releases the car at the same time. By using the hook and the position scale on the side of the ramp, the release can be easily duplicated at the same angle and height.