Structural Angle Support

My name is Dean Parker, and I have created a Diagonal Angle Support. A frequent problem when building towers or having 90° angles is support. It is nearly impossible to keep something 90° and it to be stable. However, this new piece has solved that problem. This support piece can be used to keep stability in a robot that is dealing with long c-channels being connected together.

Before I constructed it in CAD, I began measuring and sketching using a micrometer to measure the dimensions of a normal c-channel. I measured out a 45° 45° 90° triangle with the base and height set at 3 inches. Using the 45° 45° 90° triangle rule I found the hypotenuse to be 3√2 inches. I then moved into Autodesk Fusion 360 and started with a line that is 3√2 inches and made a 1 inch line 45° from each side of the line. Using a micrometer, I found that the thickness of the c-channel is .07 inches. I then offset the line I had made .07 inches outward then extruded 1 inch out. Now, having a base, I started a sketch on the side of the offset. From the very edge of the base, I made a .5 inch line going into the base then another from there 45° down until it collided with the bottom of the base. I repeated this on the other side. .5 inch from the bottom I made a line going from one side to the other. I then extruded it inward and joined it with the base. I repeated this process on the other side of the base. I now have a base with rails for support. Next is the mounting holes. I began a sketch on the diagonal base. I began with the middle hole considering it was the easiest and would help me with other holes. The square is .175 inches on all sides. I created diagonal lines from each corner of the diagonal base to pinpoint the middle of the square. I then created a hole in the center of the square. I then measured the outer squares from left to right and found that the edges of the holes and found it was .675 inches. I then made a .675 inch square and made .175 inch holes in each corner. I then cut it by extruding and repeated the whole process on the other side.

I learned in this project how to properly align small measurements in CAD. I have thought of using CAD in the future for a job, but haven’t decided on what yet. Using CAD for robotics has helped tremendously from helping hold license plates to holding batteries in their chargers. I believe CAD will help me in my engineering career because lots of engineering jobs hire people for CAD.