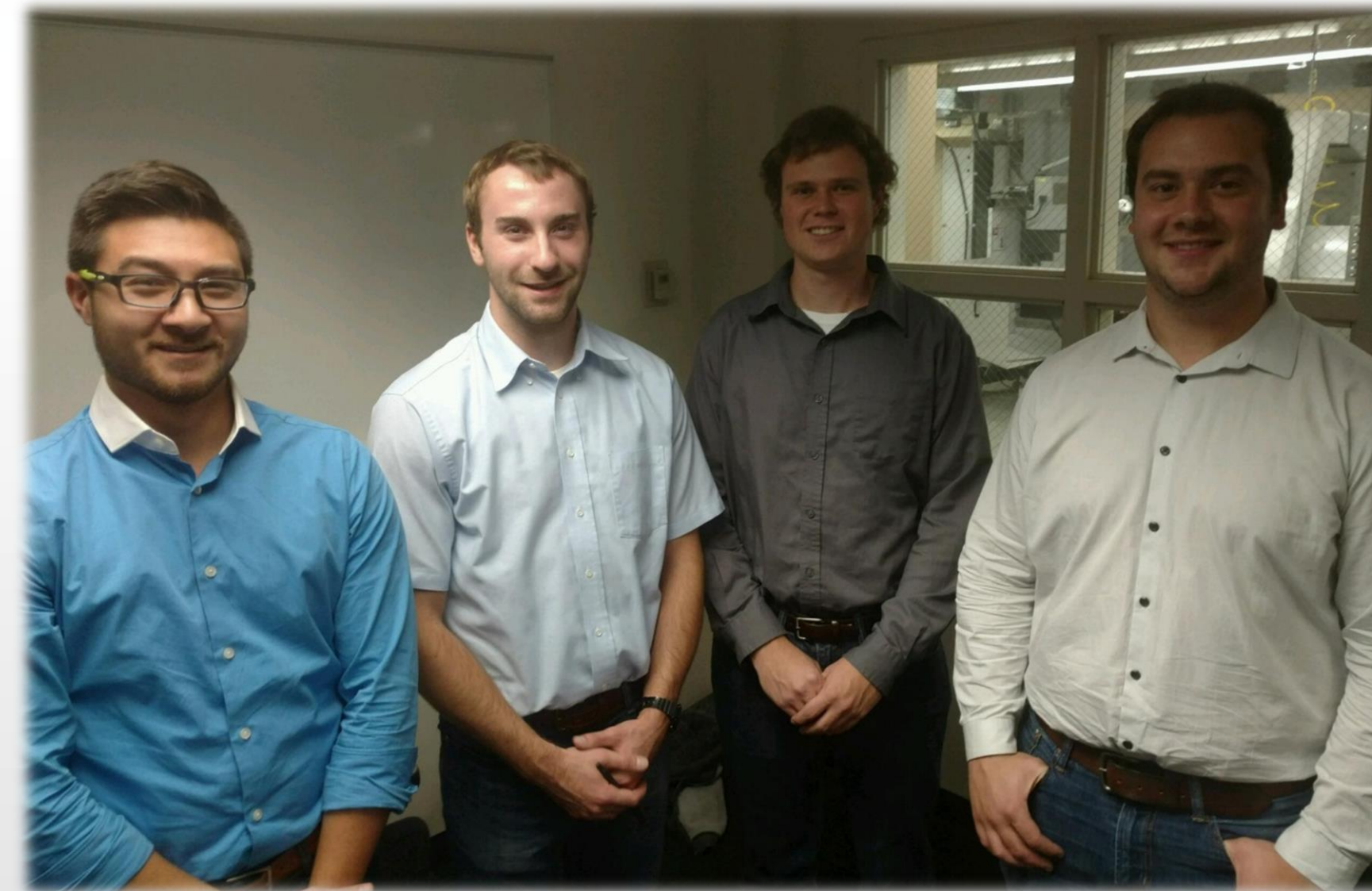


Colmac Coil: Drain Pan Welding Jig

Problem Background

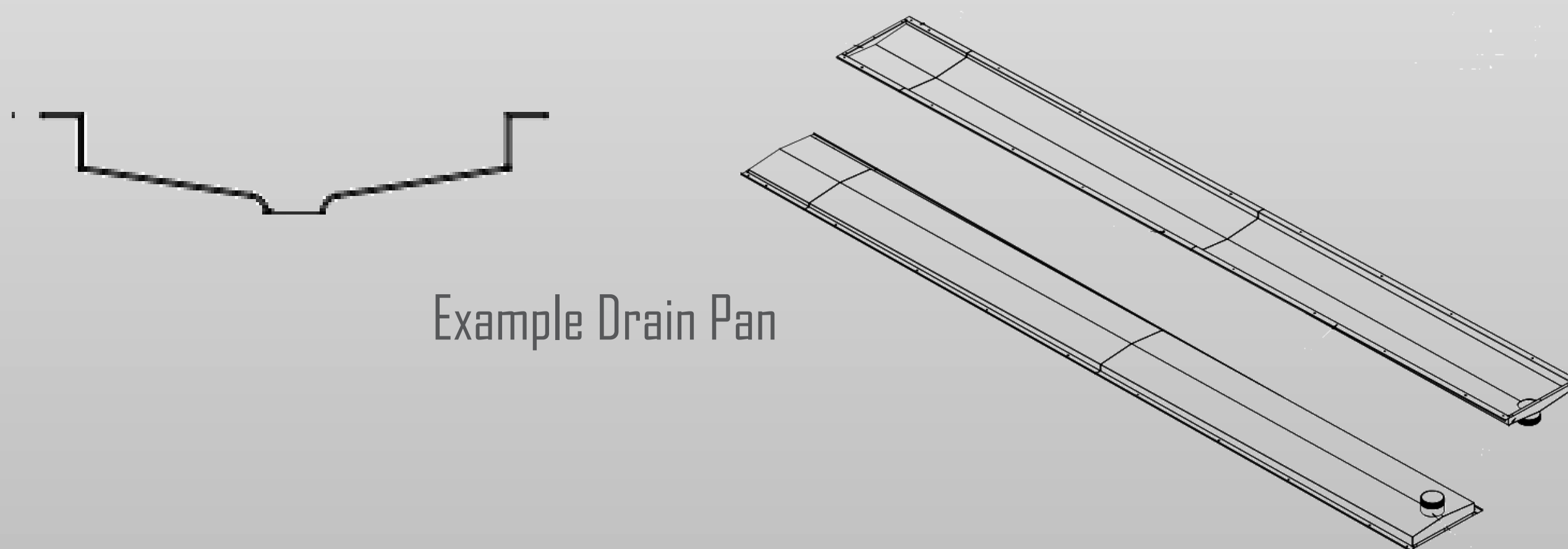
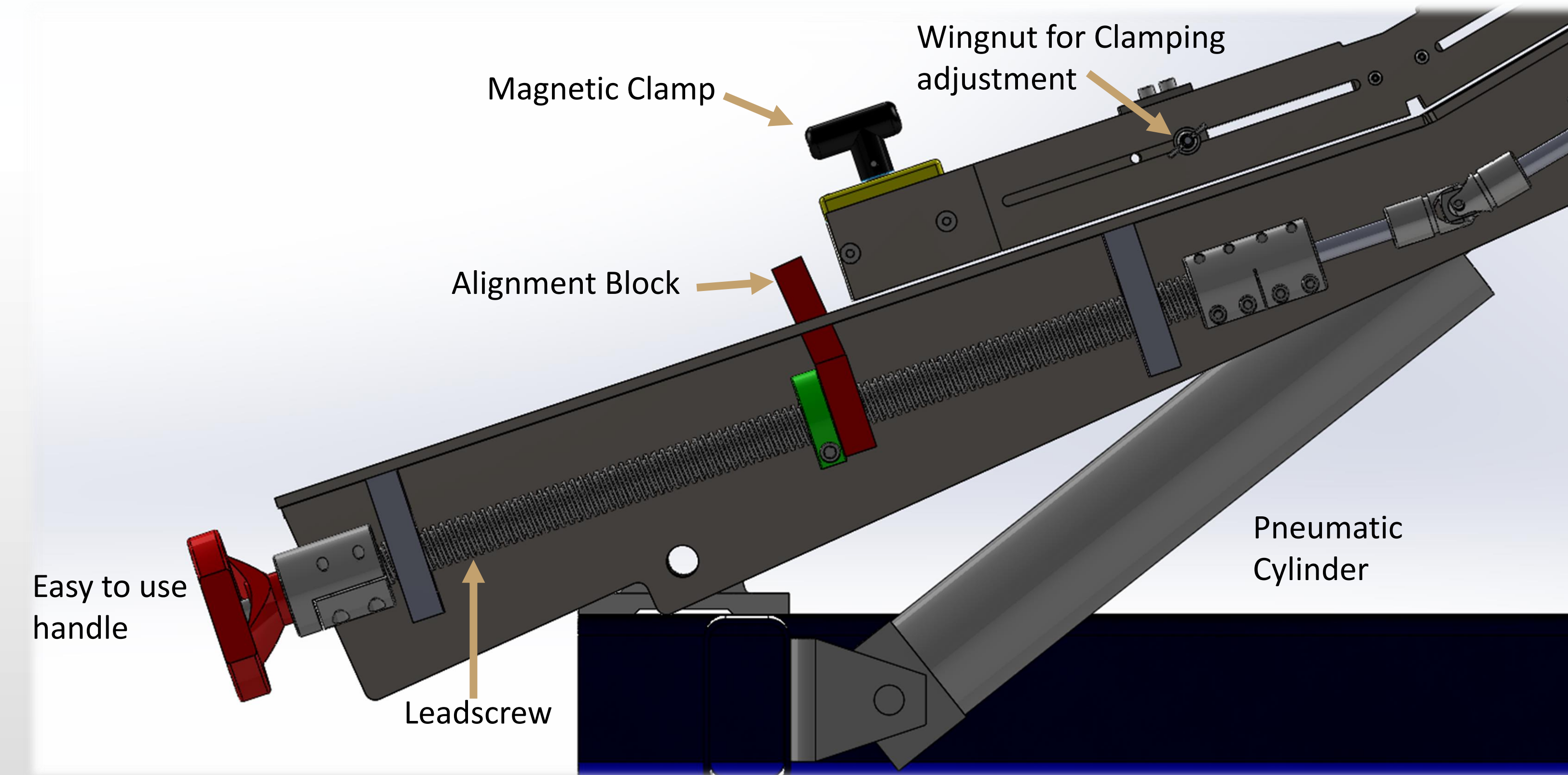
Colmac Coil asked us to improve upon their existing drain pan welding jig design used for daily welding operations. These drain pans are attached to the bottom of the heat exchangers that Colmac produces that catch drainage liquid from the defrost cycle. Each drain pan has a triple-pitch design which allows the water to be collected at the end of the pan. Drain pans can be as long as 30 feet and as wide as 4 feet. It is crucial that the welds are smooth and consistent so that the water can flow freely. Additionally, the side flanges need to be level and flush along the drain pan so that when the pan is mounted on the underside to a unit it fits correctly.

Notorious ENG



Taylor Tosaya, Michael Botterbusch,
Scout Ferguson, Dakota McDaniel

Solution



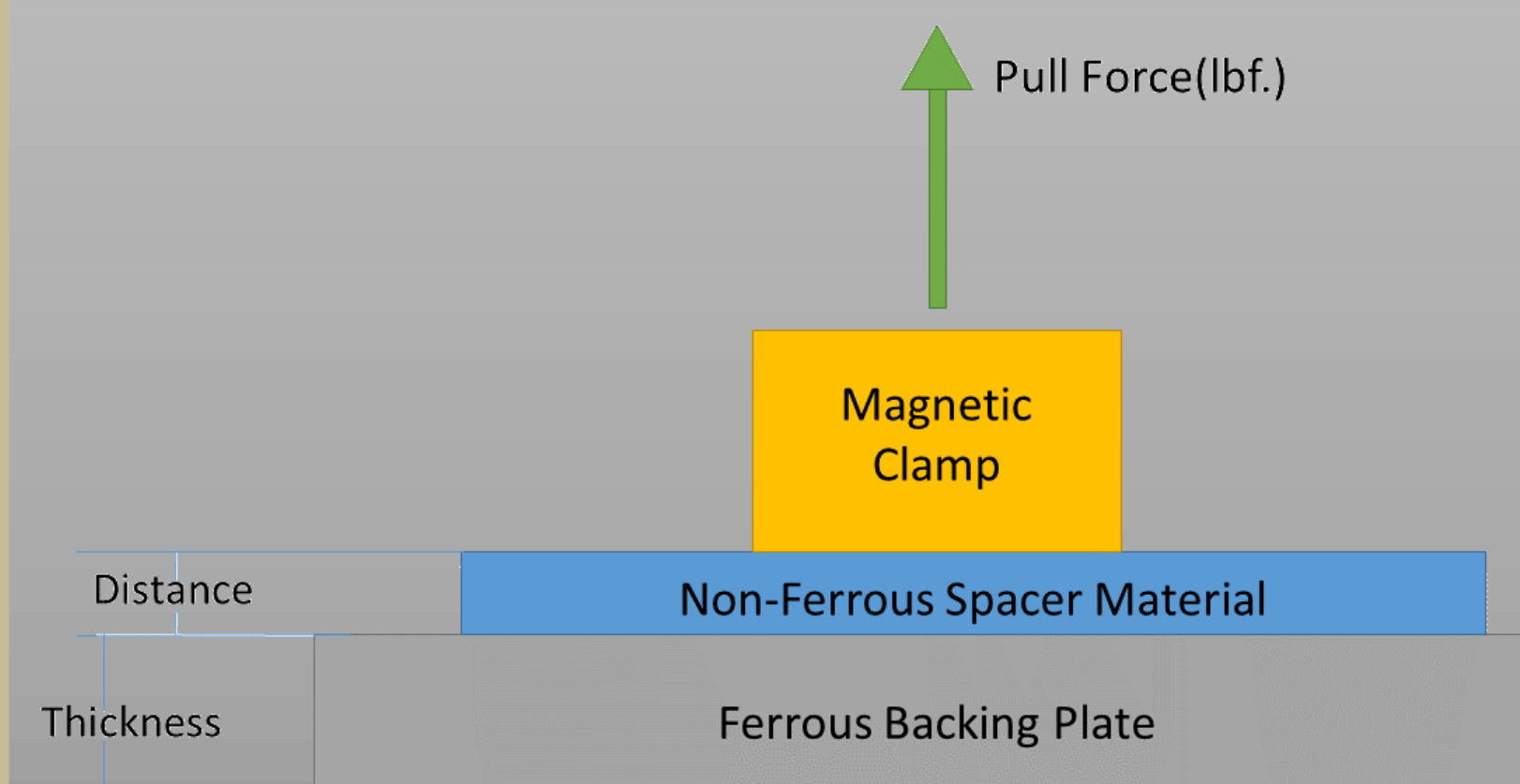
Example Drain Pan

Project Goals

Feature	Rational
Frame Height	Jig frame must be easily accessible for welders; a bit taller than waist height.
Force Distribution	Apply an evenly spread distributed force along sections of the drain pan to reduce warping.
Ease of Use	Allow the entire mechanism to be user-friendly.
Mobility	Allow the jig to be able to move around the welding facility.
Safety	Design jig with plenty of safety and fail-safe features.

Project Learning

In order to verify the clamping design, we tested the strength the magnetic clamps. An experiment was conducted to find the effect of distance and backing plate thickness on magnetic pull strength.



Design Features

Motion:	Pneumatic Cylinders
Damping:	Rubber Bump-stops and 3" Stroke Speed Control Regulator
Alignment:	Leadscrew Design with Universal Joint
Clamping:	Magnetic Clamps in Custom Fixture

