

# **BioSand Water Filter**

## **Steel Mold**

### **Construction and Assembly** **Drawings**

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**Drawings: Ronaldo Cayanan, Drafting Tech.**

**April 20`10**

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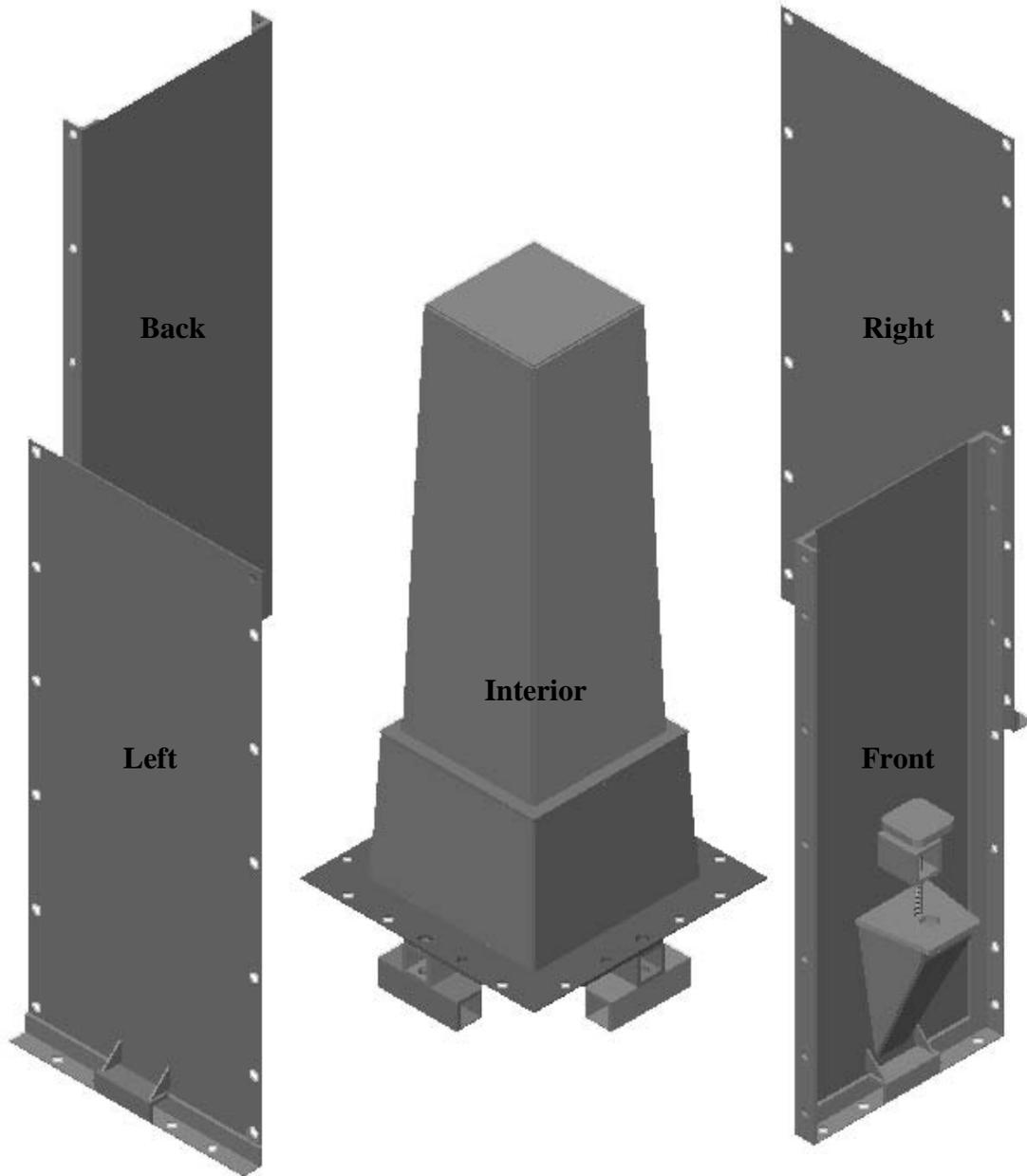
## **1. Comments**

The purpose of these sketches is to aid in the visualization of the construction and assembly of the steel mold.

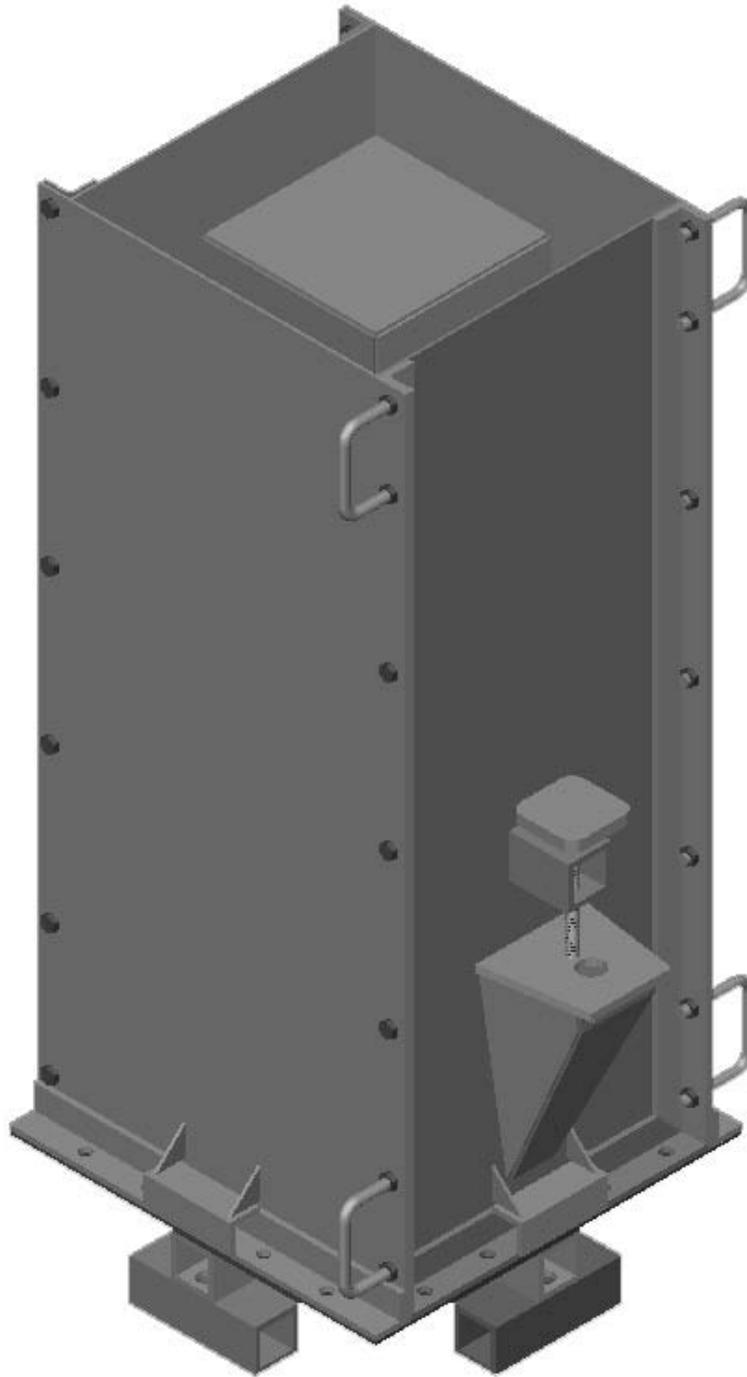
These sketches are intended to be used with the associated autocad drawings of the elements and assembly of the steel mold. These drawings are available in pdf.

The instruction manuals on the steel mold and its use are also very useful to the fabricator to understand exactly how the steel mold is used.

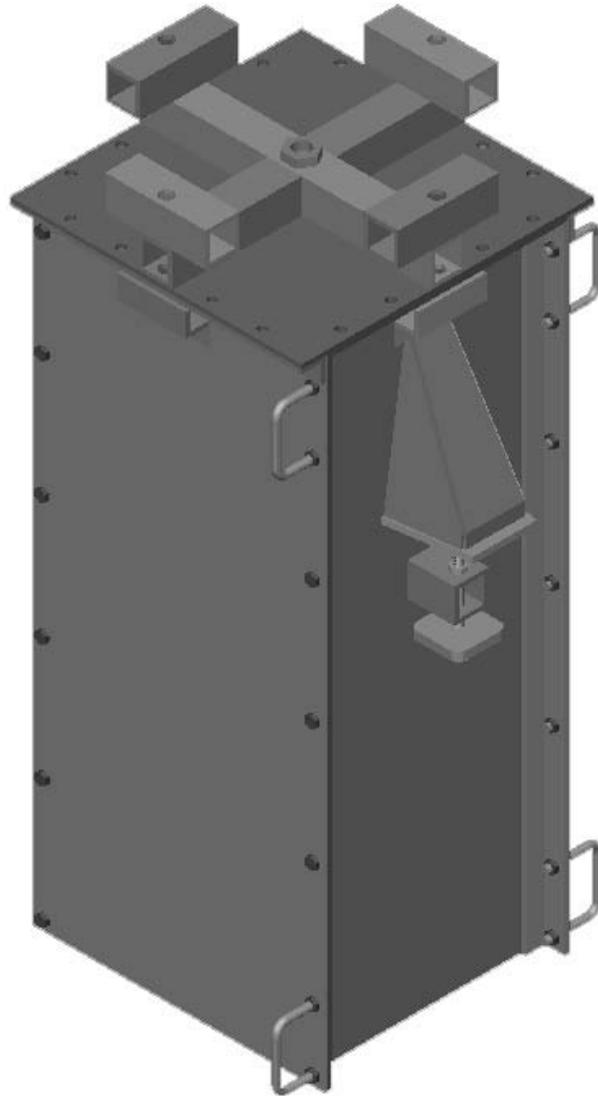
## **2. Assembly of Major Steel Mold Elements**



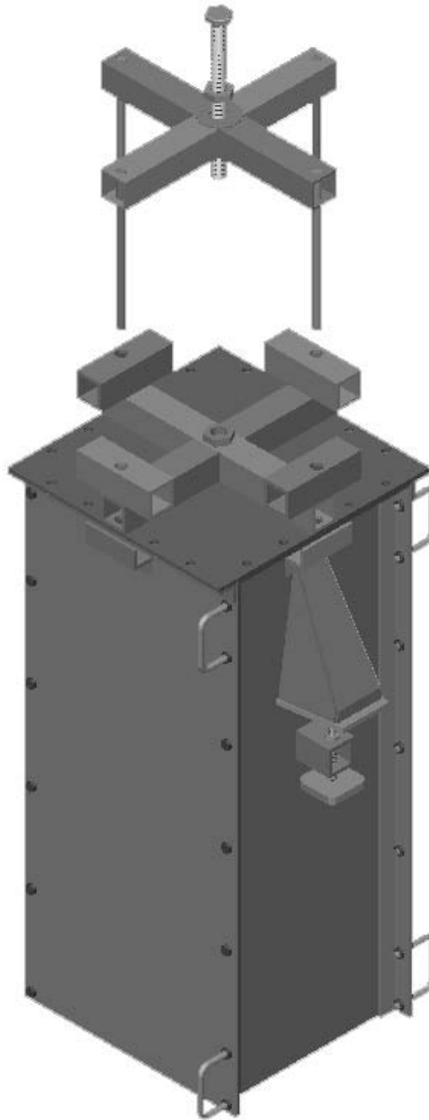
**Figure 1 Four side panels and interior mold.**



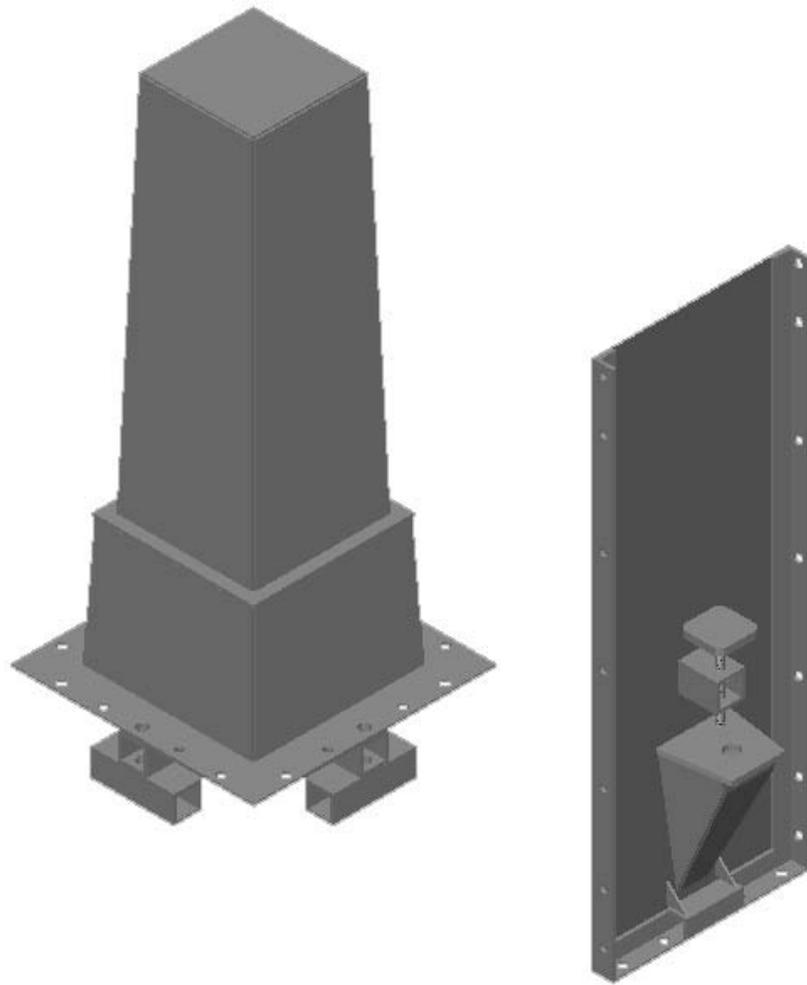
**Figure 2 Assembled steel mold with bolts in side panels – front view. Note that side panels are bolted to the bottom of the interior mold using four bolts per panel.**



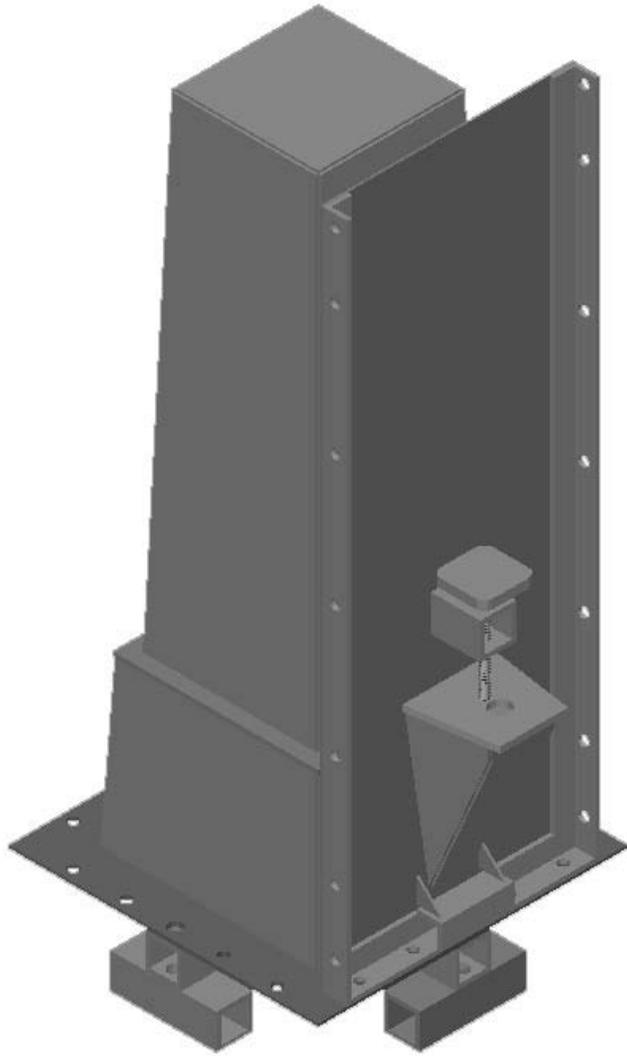
**Figure 3 Inverted assembled steel mold with bolts in side panels – front view. Note that side panels are bolted to the bottom of the interior mold using four bolts per panel.**



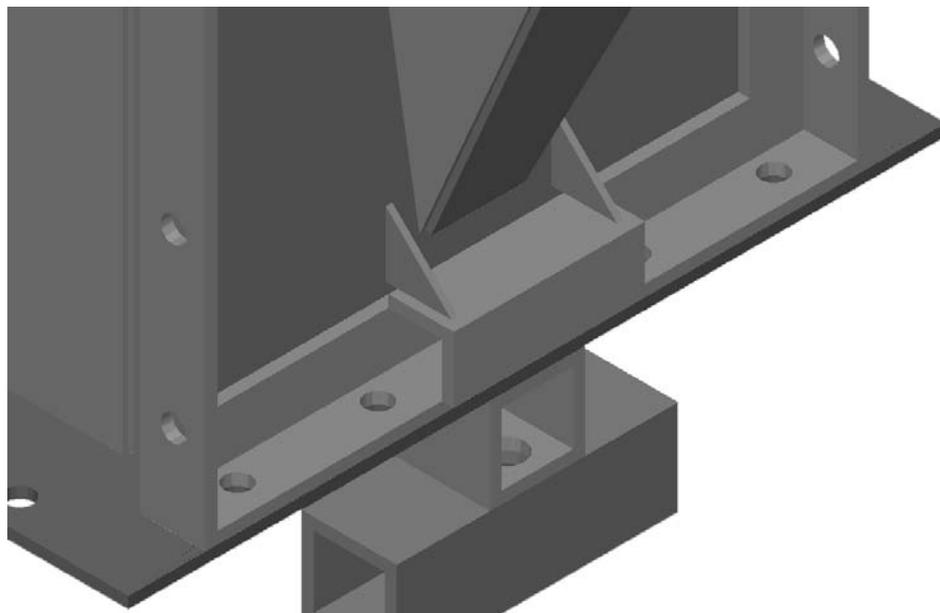
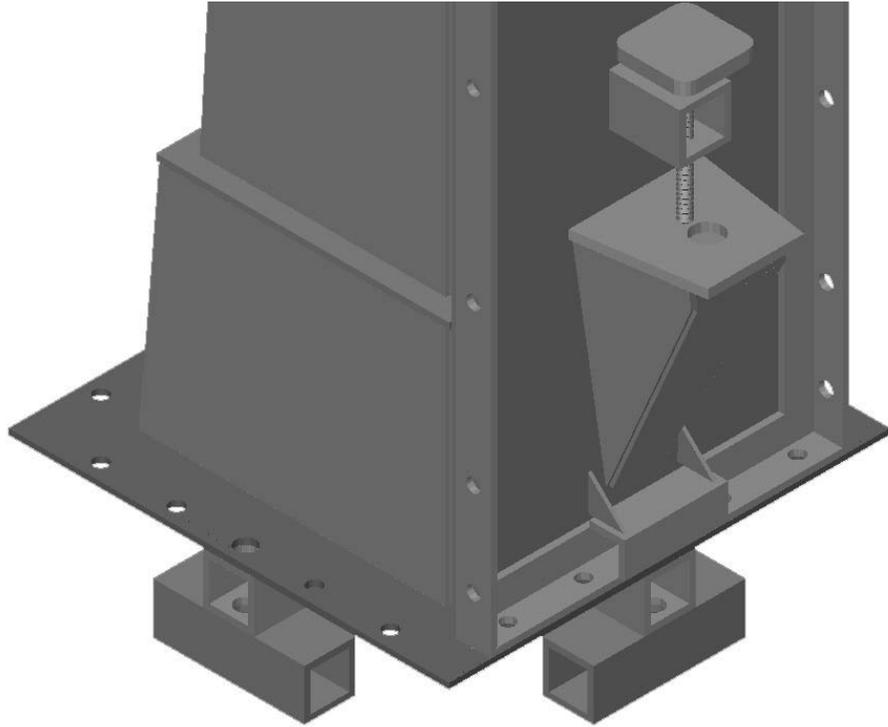
**Figure 4 Inverted assembled steel mold with puller. Note that side panels are bolted to the bottom of the interior mold using four bolts per panel.**



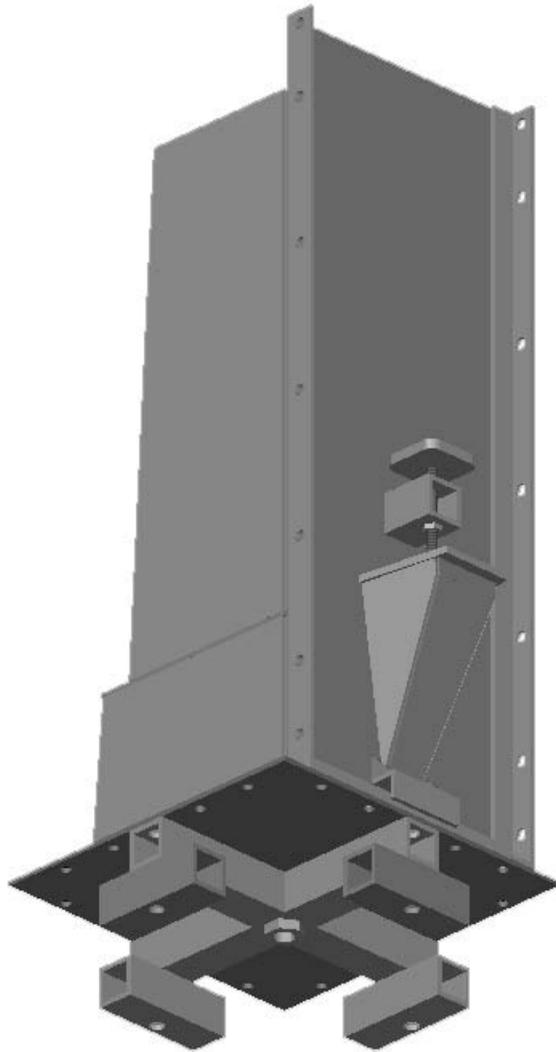
**Figure 5a Locating front panel on interior mold.**



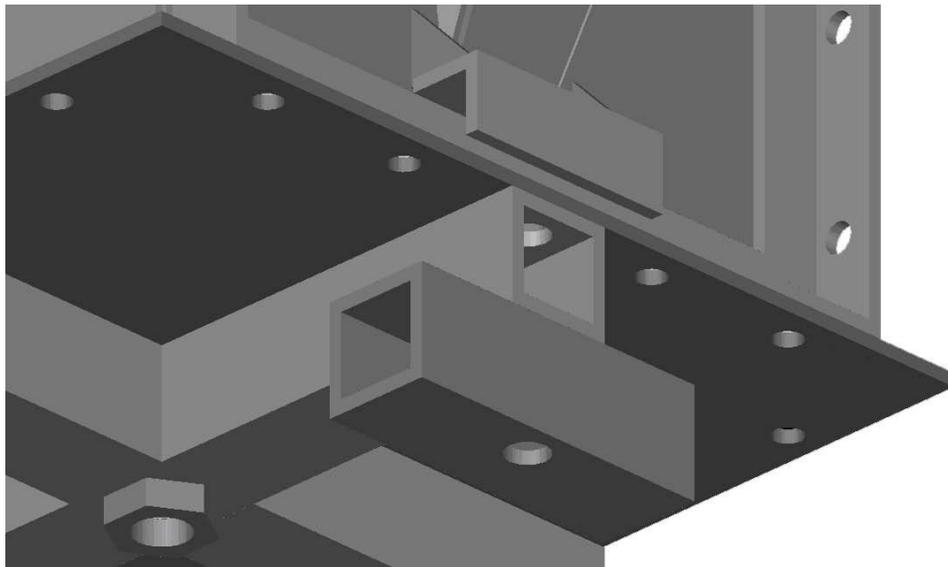
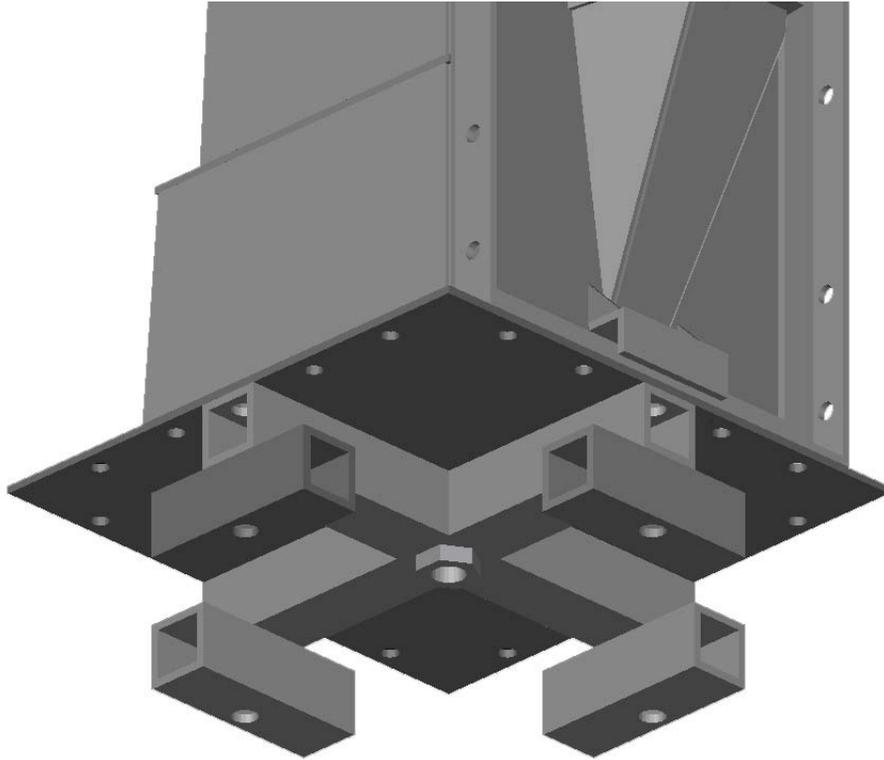
**Figure 5b Locating front panel on interior mold. At this time the four bottom bolts are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



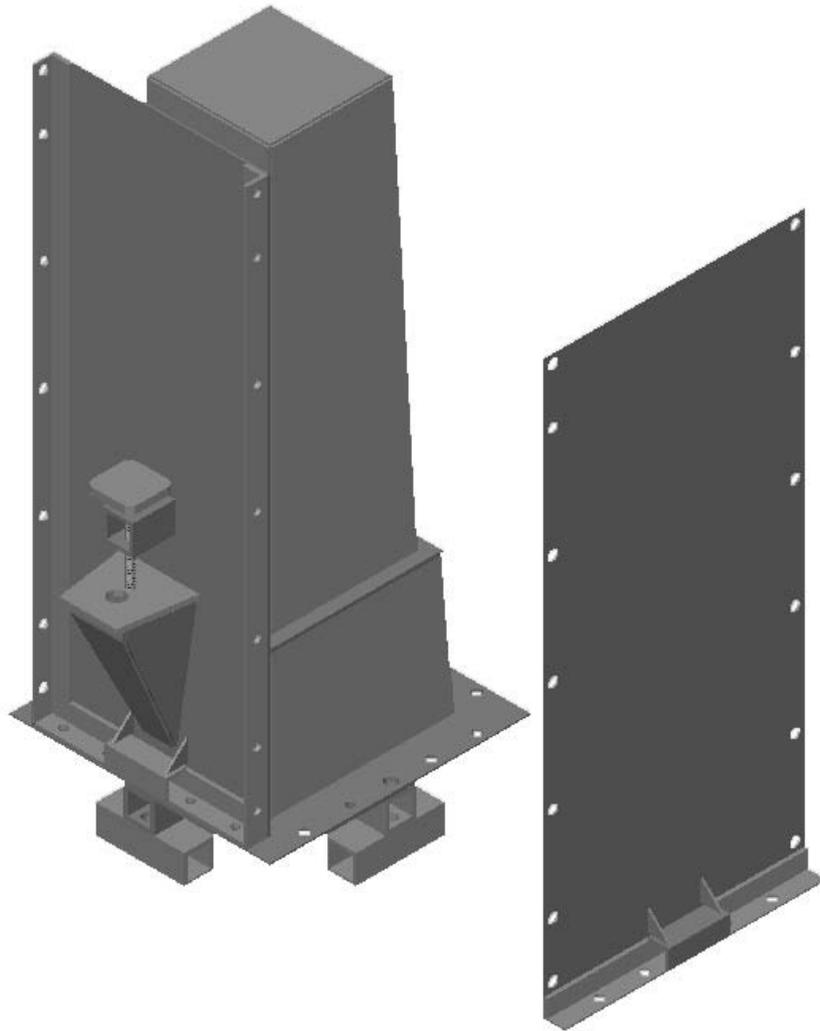
**Figure 5c Locating front panel on interior mold. At this time the four bottom bolts are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



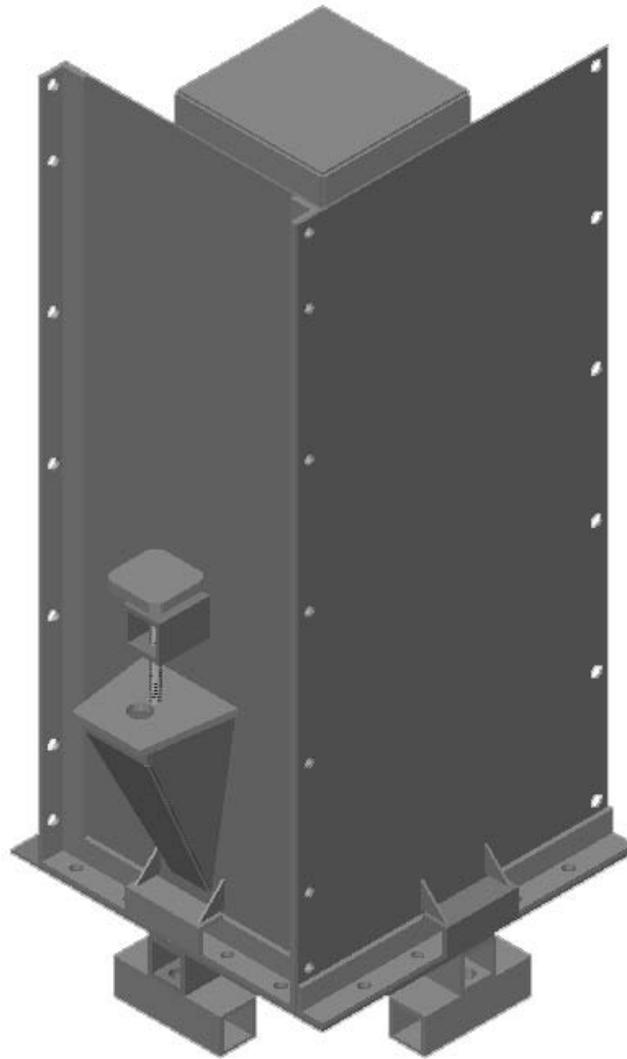
**Figure 5d Locating front panel on interior mold. At this time the four bottom bolts are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



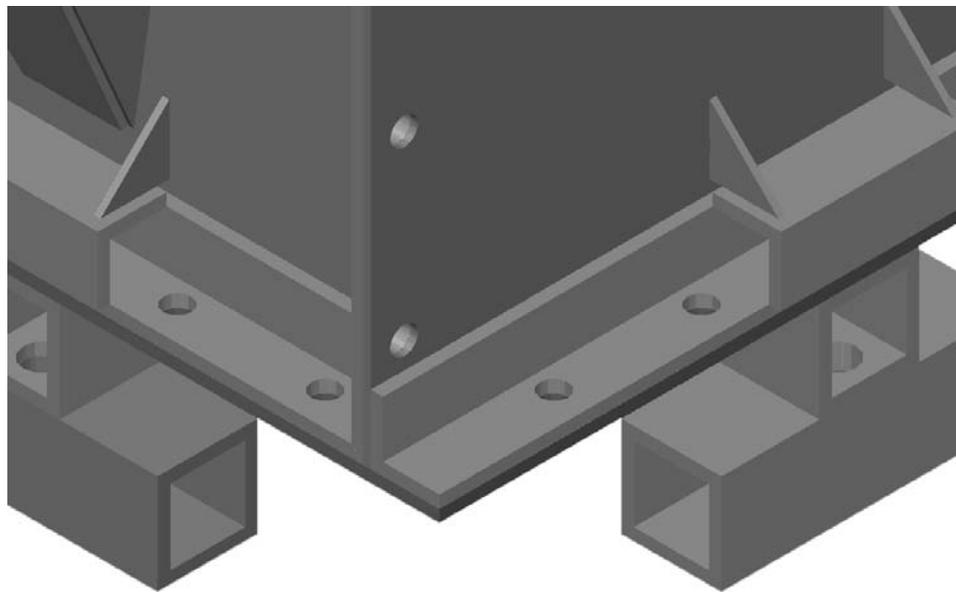
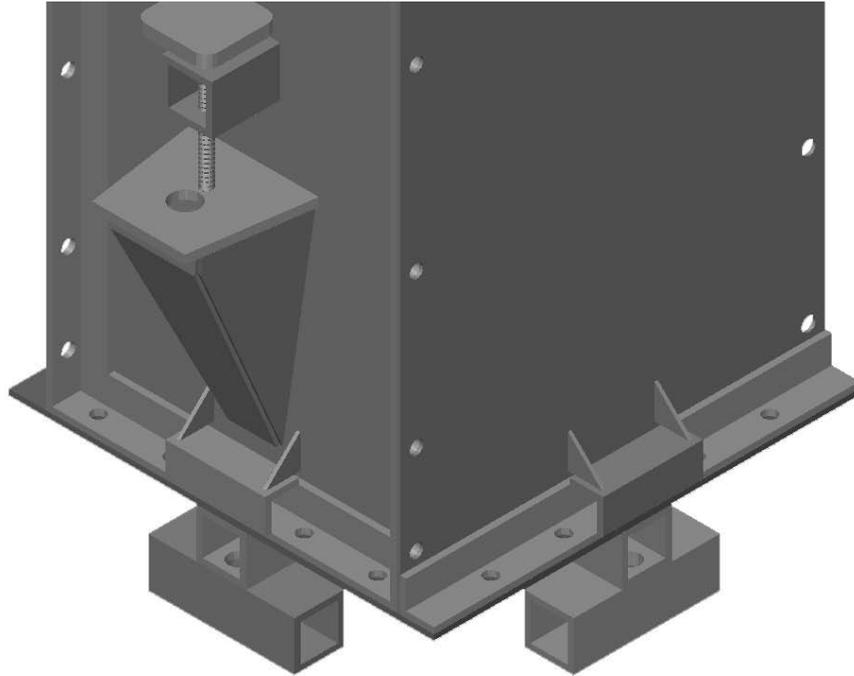
**Figure 5e Locating front panel on interior mold. At this time the four bottom bolts are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



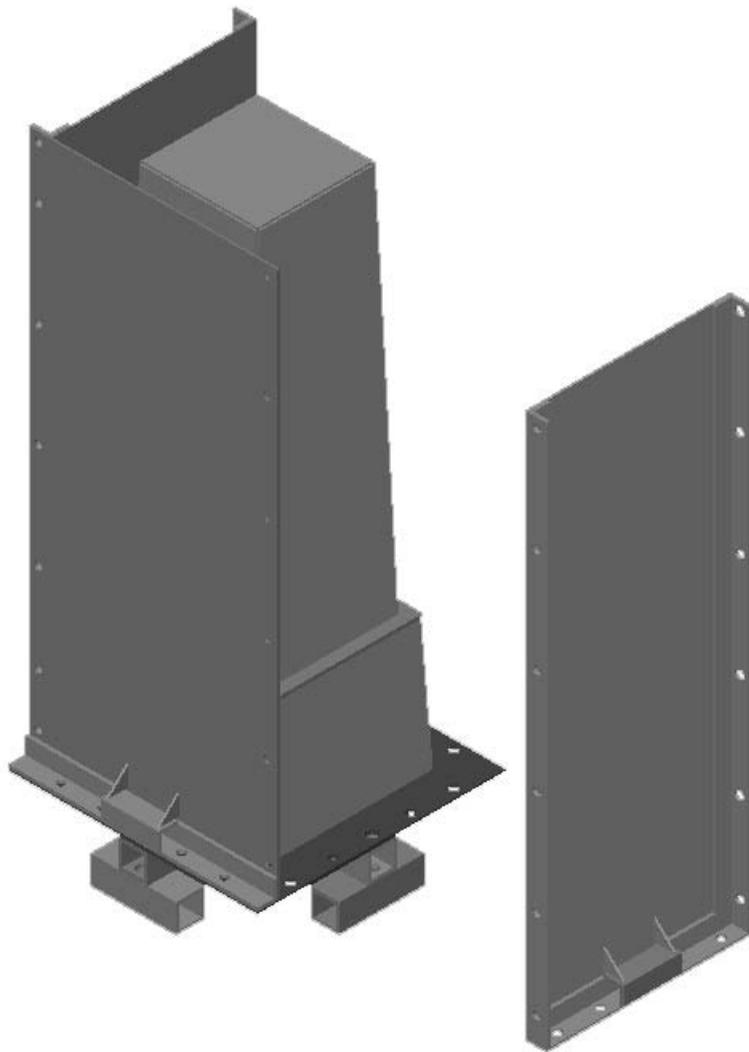
**Figure 6a Locating right panel on interior mold. At this time the four bottom bolts and all of the side bolts and handles are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



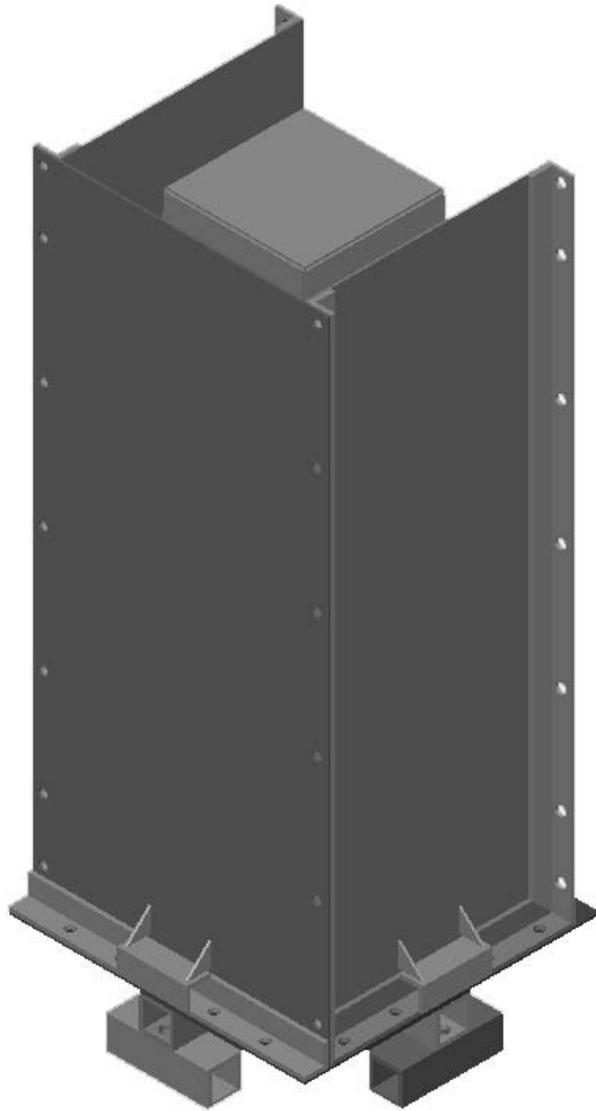
**Figure 6b Locating right panel on interior mold. At this time the four bottom bolts and all of the side bolts and handles are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



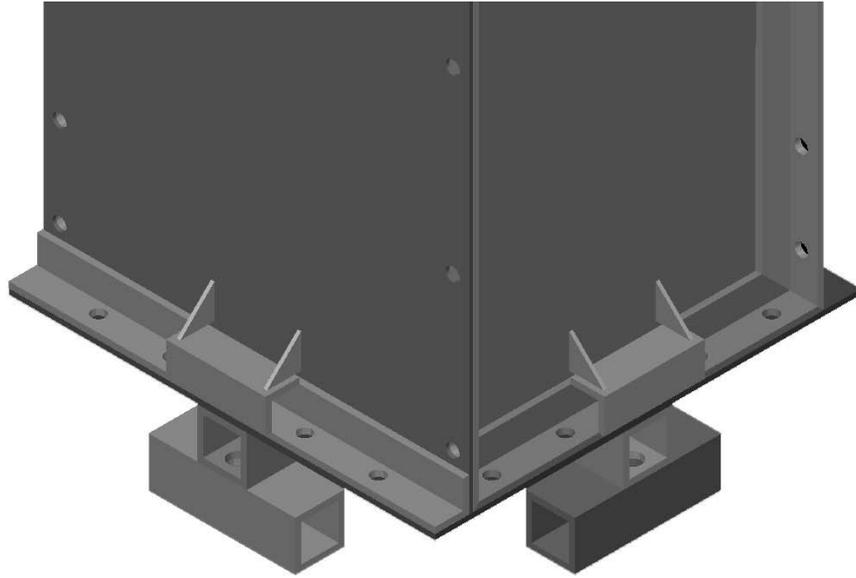
**Figure 6c Locating right panel on interior mold. At this time the four bottom bolts and all of the side bolts and handles are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



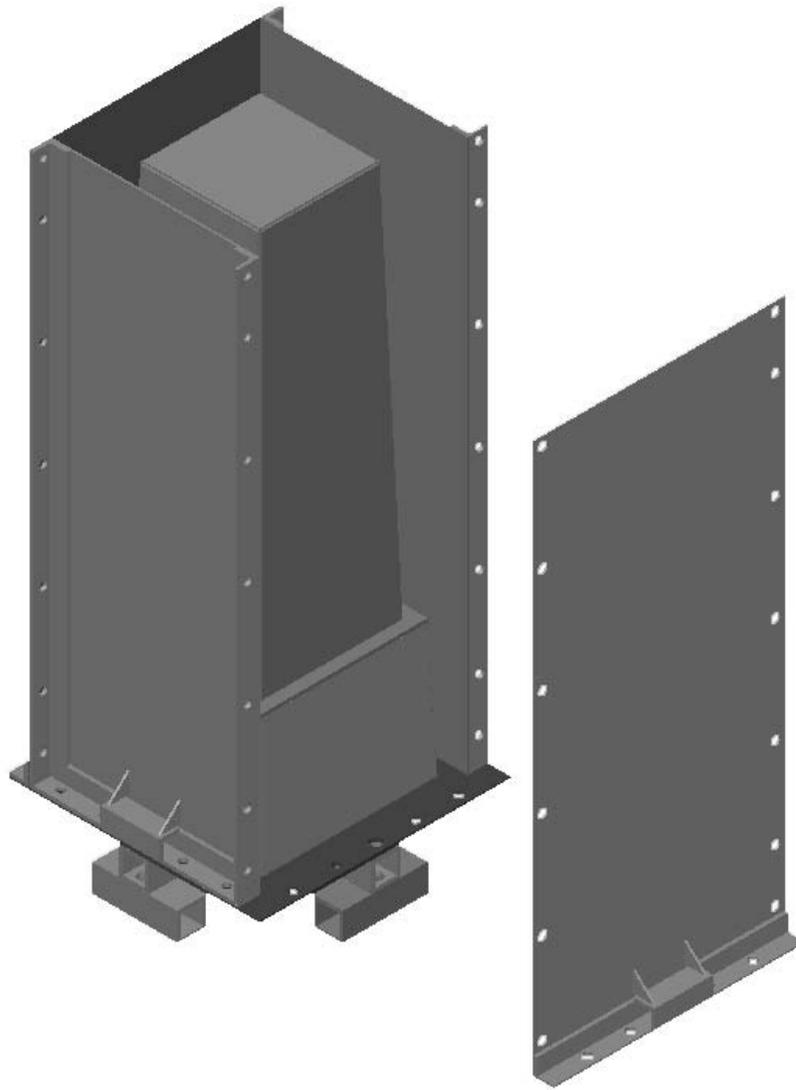
**Figure 7a Locating back panel on interior mold. At this time the four bottom bolts and all of the side bolts are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



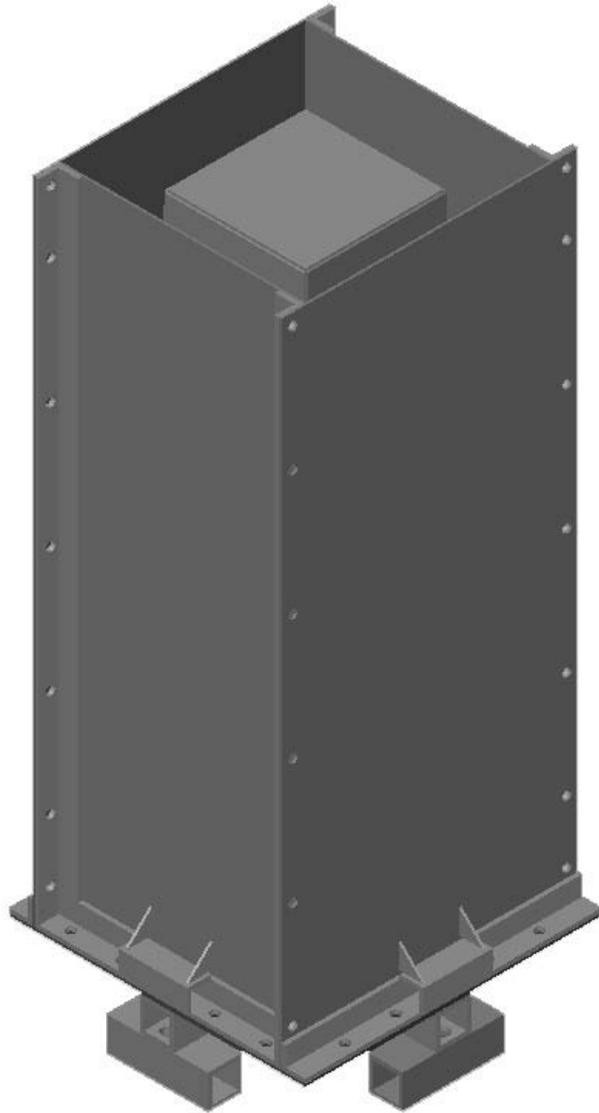
**Figure 7b Locating back panel on interior mold. At this time the four bottom bolts and all of the side bolts are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



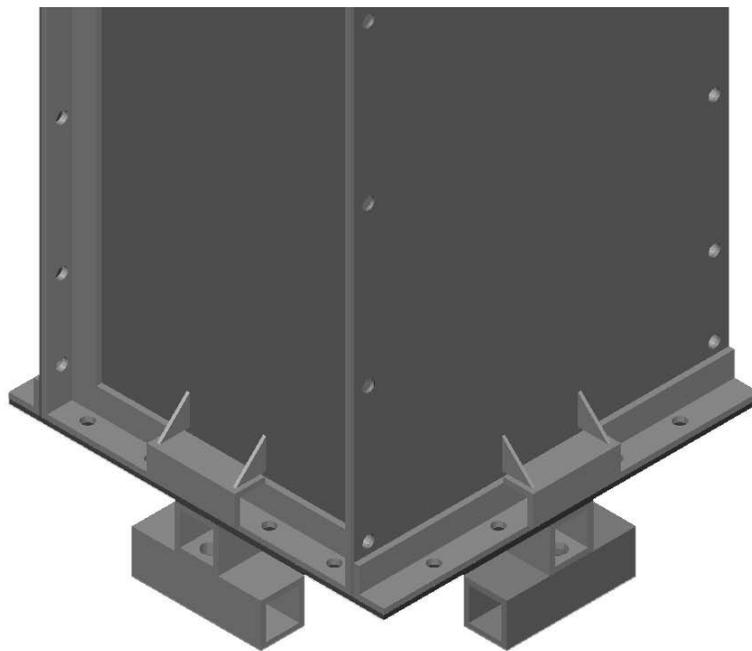
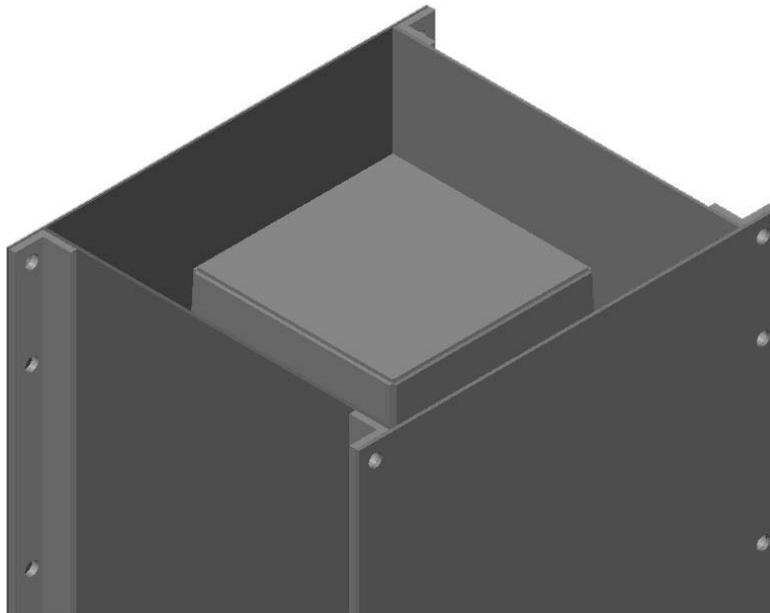
**Figure 7c Locating back panel on interior mold. At this time the four bottom bolts and all of the side bolts are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



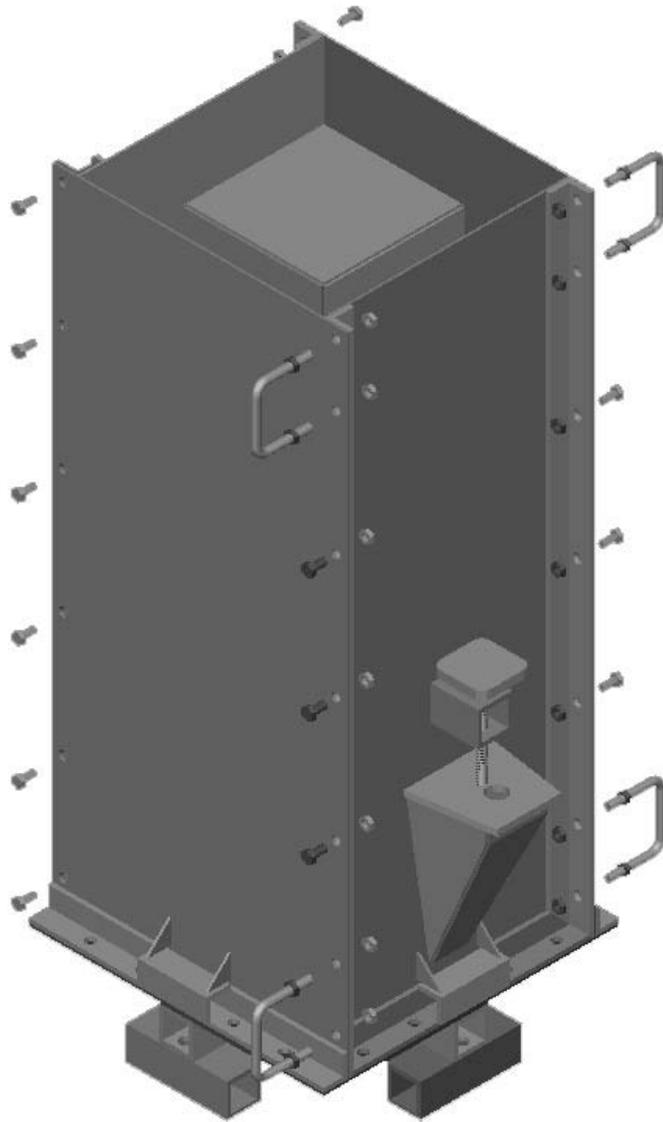
**Figure 8 Locating left panel on interior mold. At this time the four bottom bolts and all of the side bolts and handles are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



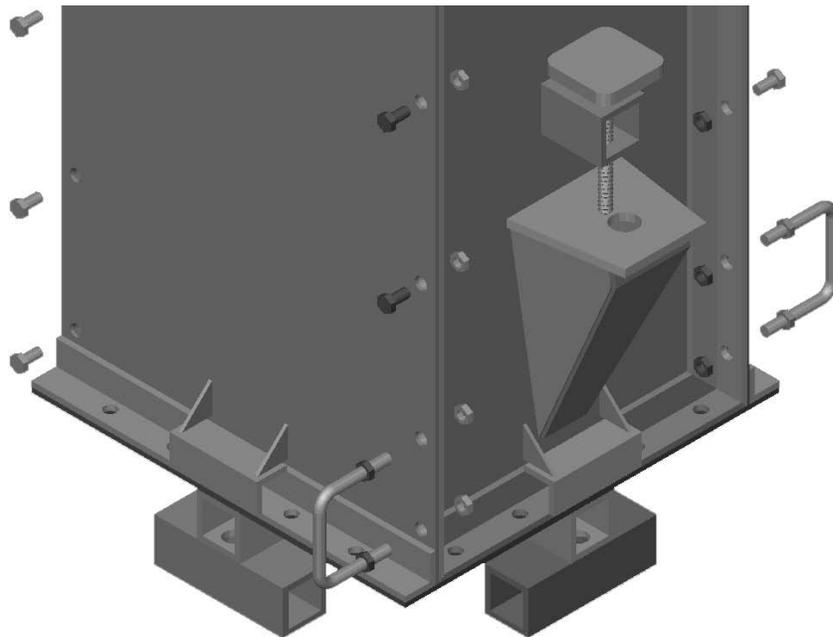
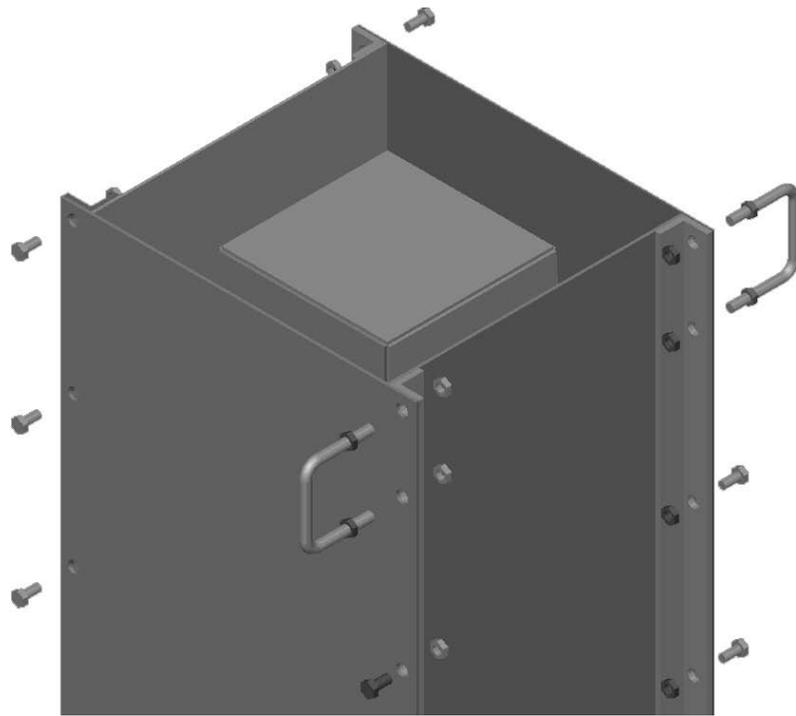
**Figure 8 Locating left panel on interior mold. At this time the four bottom bolts and all of the side bolts and handles are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



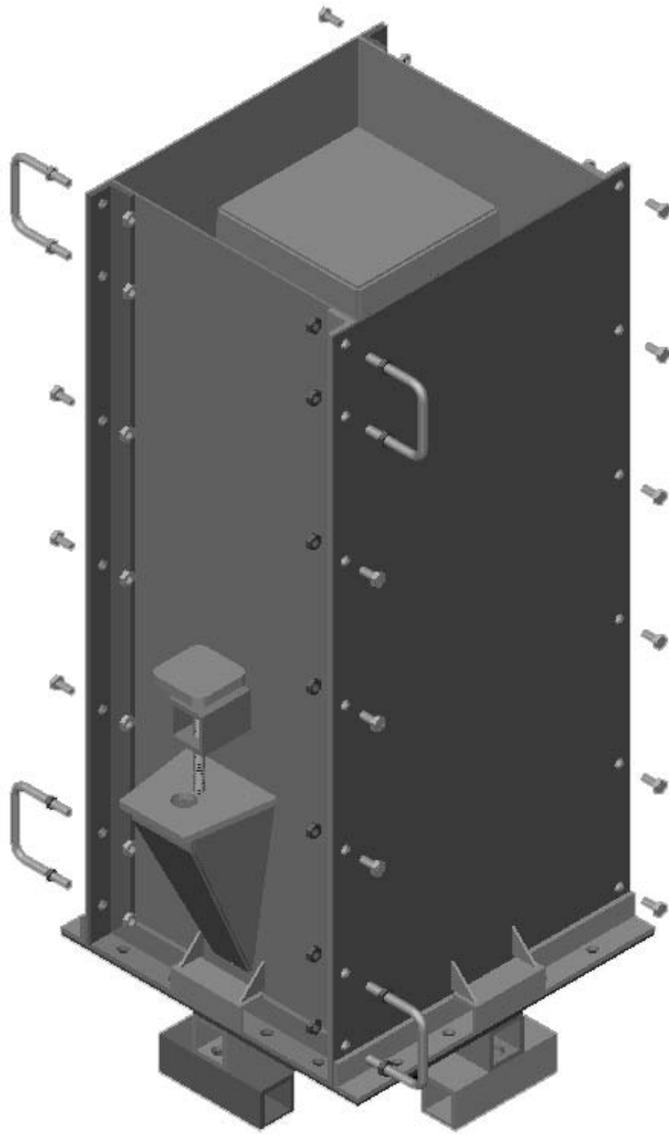
**Figure 8 Locating left panel on interior mold. At this time the four bottom bolts and all of the side bolts and handles are inserted to hold panel in place. Note that the bolts are loosely fitted. All bolts will be securely tightened when all panels and bolts are located and loosely fitted.**



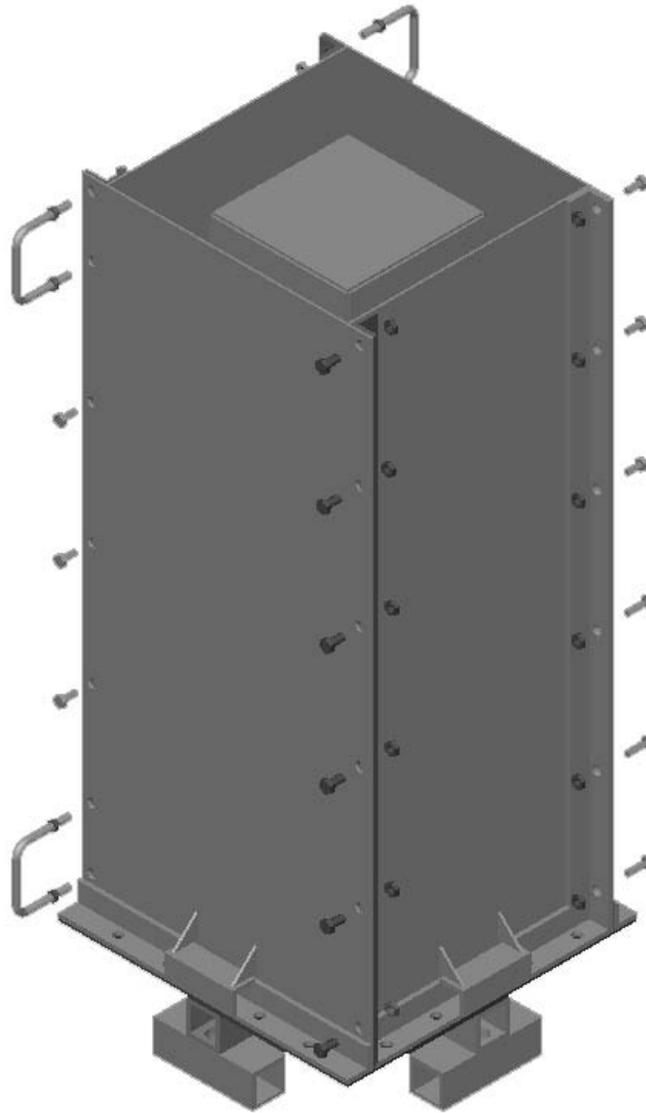
**Figure 9a Location of bolts and handles holding side panels.**



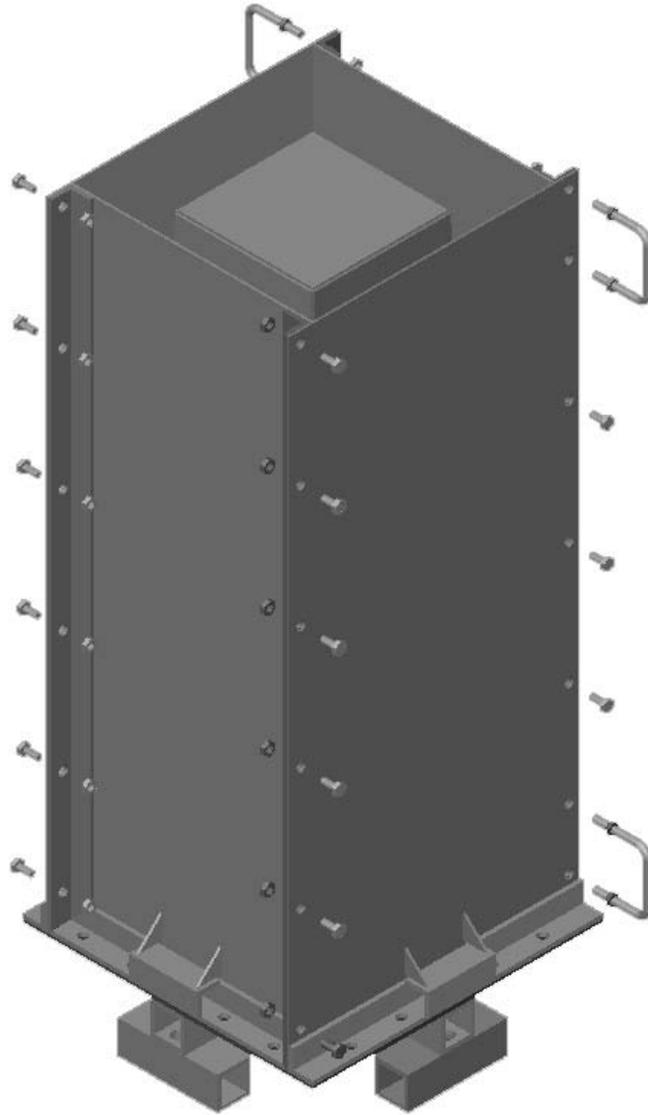
**Figure 9b Location of bolts and handles holding side panels.**



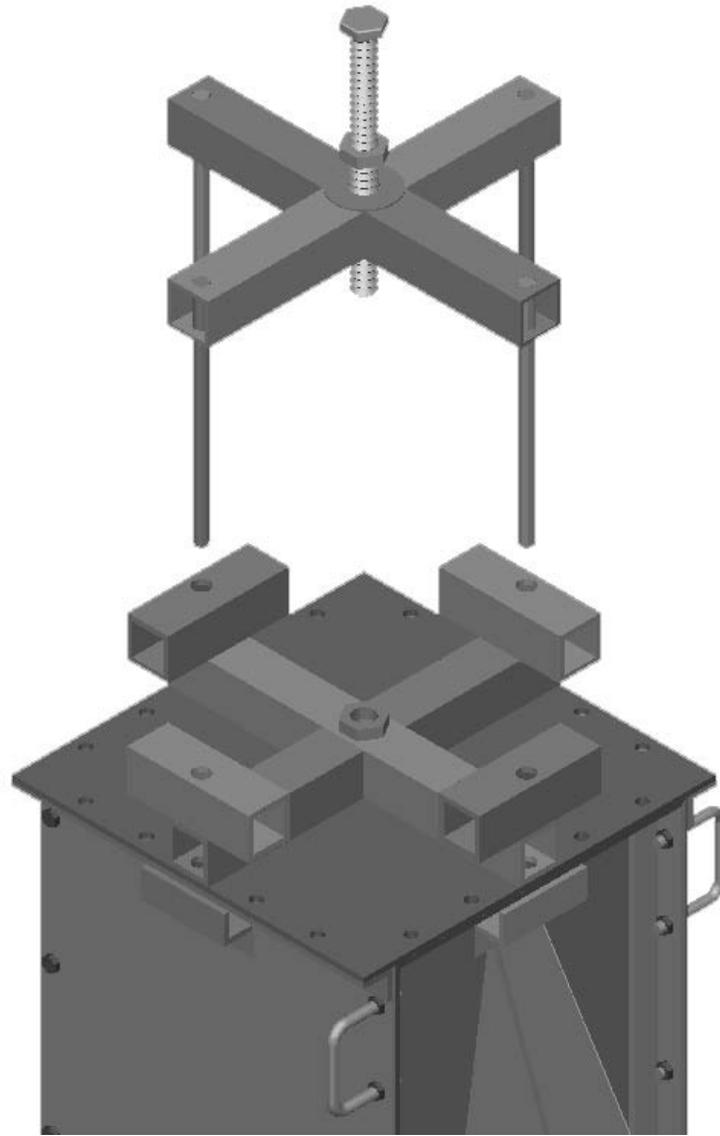
**Figure 9c Location of bolts and handles holding side panels.**



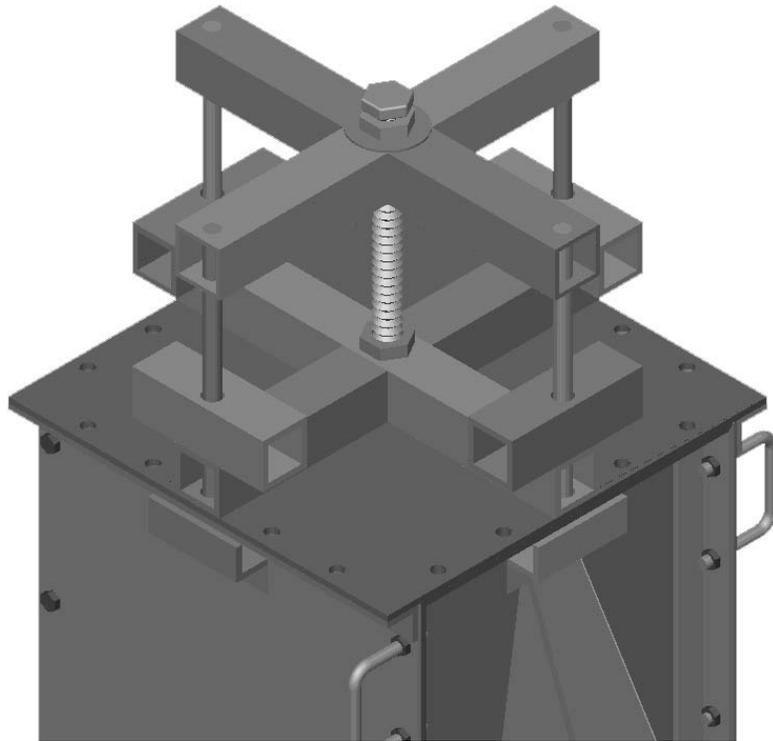
**Figure 9d Location of bolts and handles holding side panels.**



**Figure 9e Location of bolts and handles holding side panels.**



**Figure 10a Positioning of puller.**



**Figure 10b Positioning of puller.**

### 3. Assembly of Outer Mold

#### 3.1 Front Panel



Figure 11a Assembling the front panel - attaching angle iron.

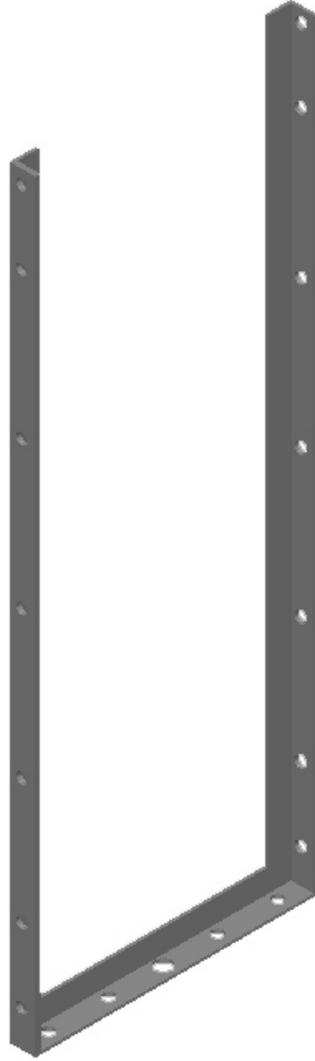


Figure 11b Assembling the front panel - attaching angle iron.

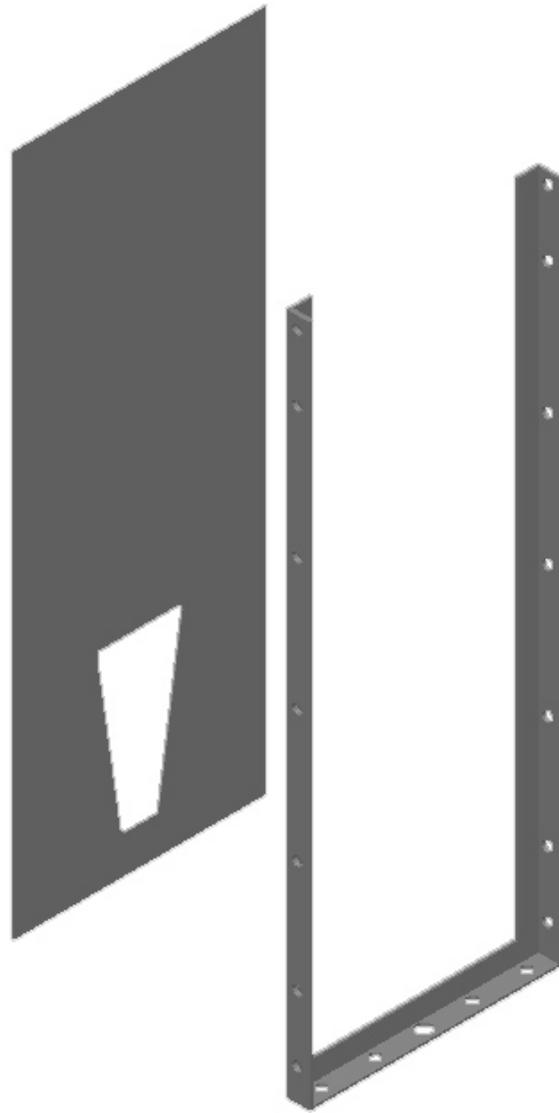


Figure 11c Assembling the front panel - attaching angle iron.



Figure 11d Assembling the front panel - attaching angle iron.



Figure 11e Assembling the front panel - attaching angle iron.

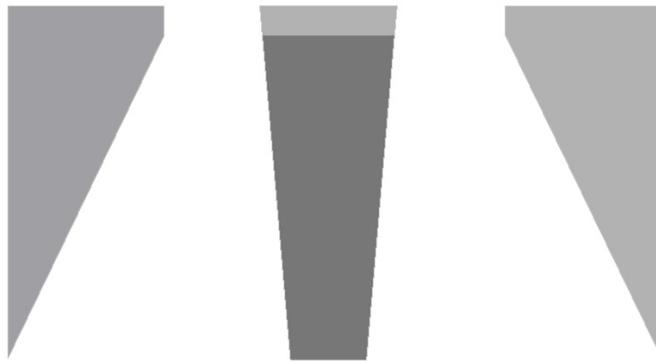


Figure 12a Nose pieces.

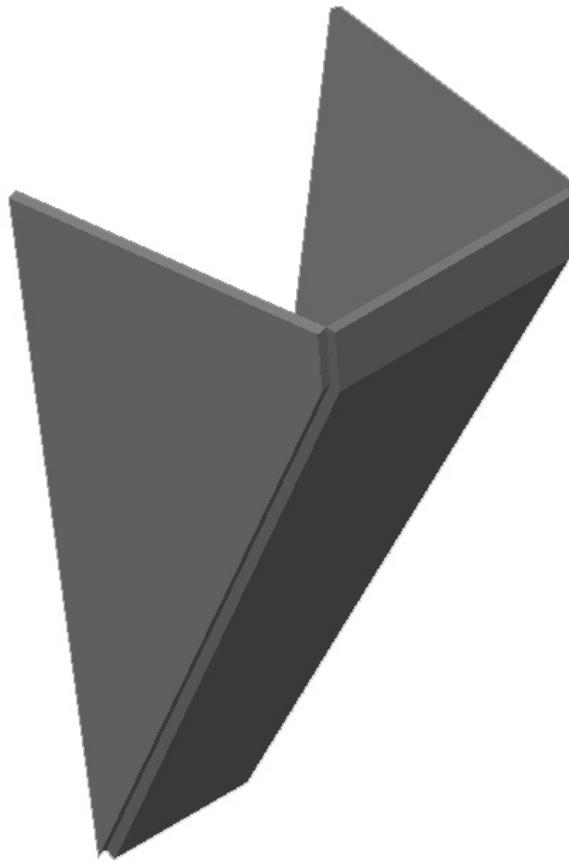


Figure 12b Assembled nose piece.



Figure 13a Attaching nose to front panel.

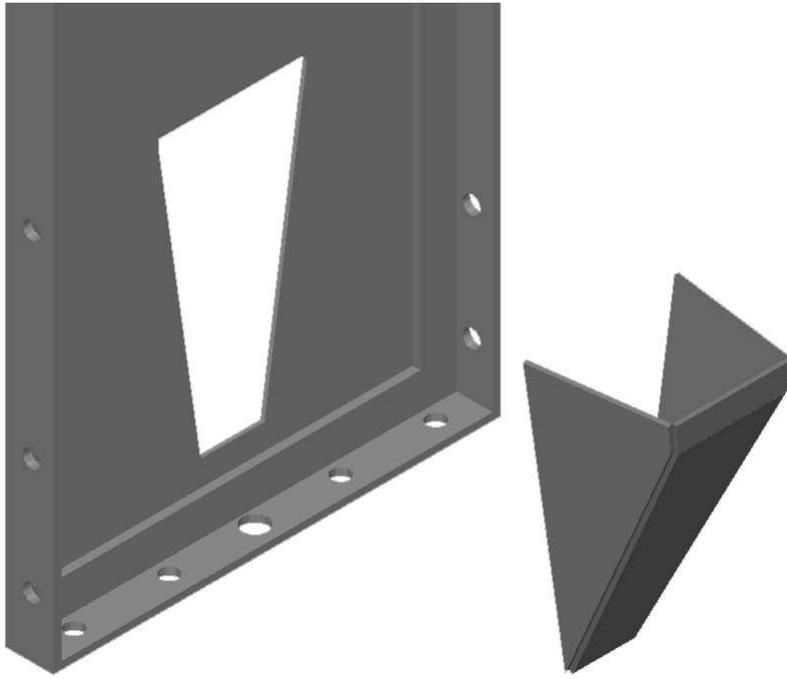


Figure 13b Attaching nose to front panel.

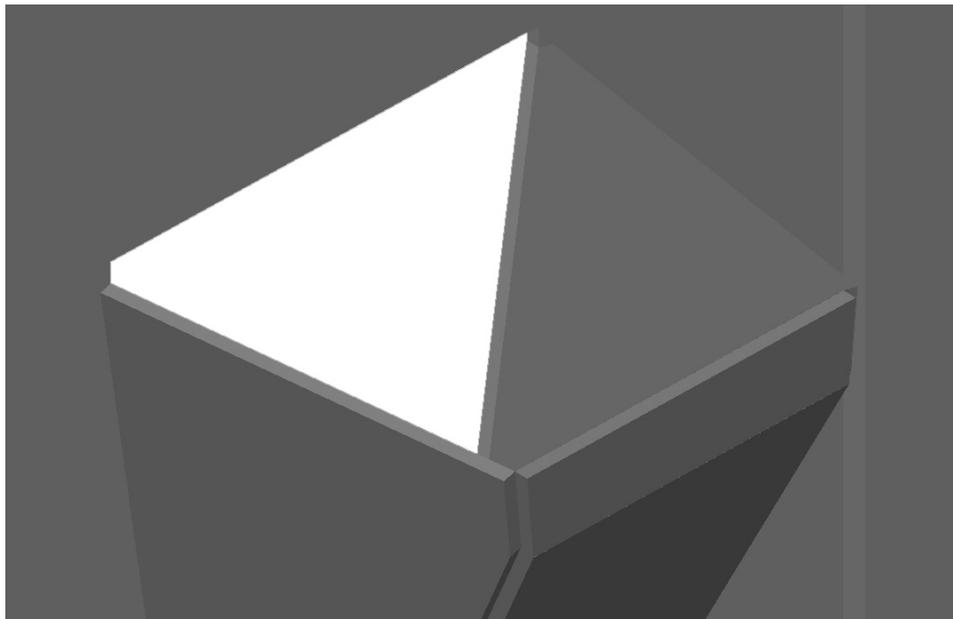
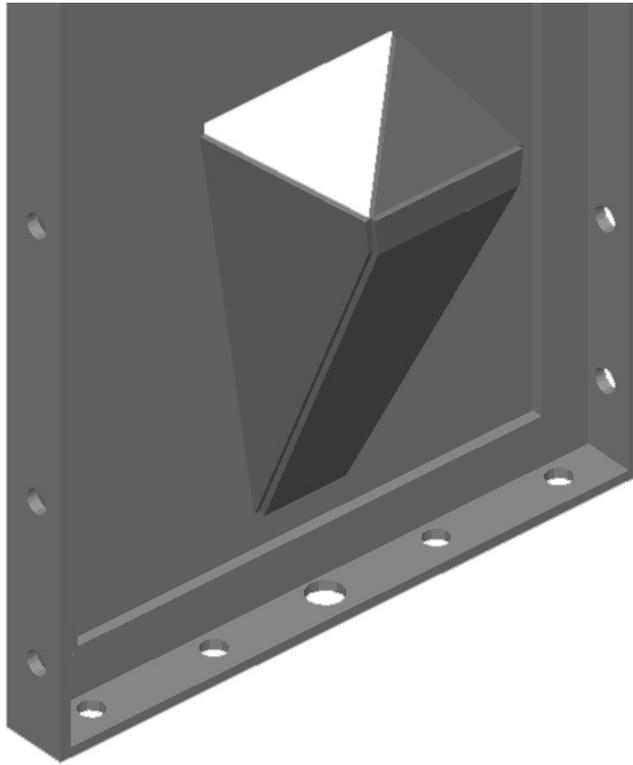


Figure 13c Attaching nose to front panel.



Figure 13d Front of front panel with nose piece attached.



Figure 13d Back of front panel with nose piece attached.

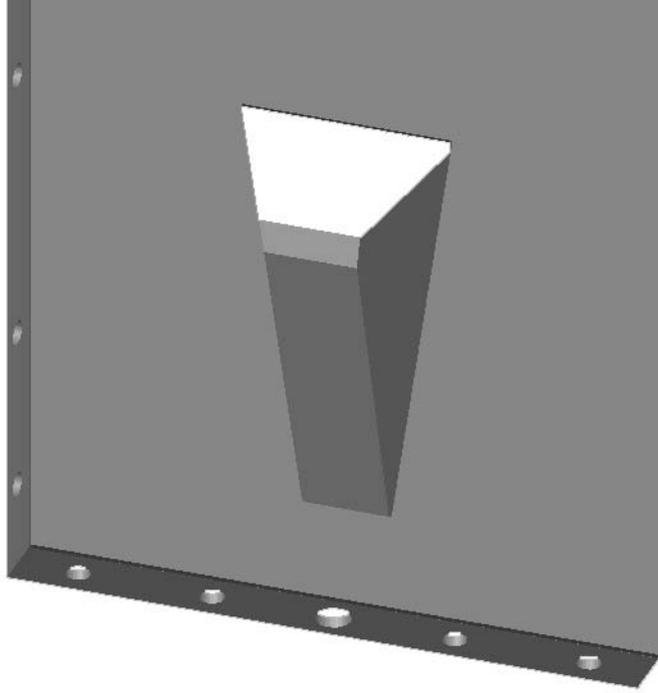


Figure 13e Looking into nose piece from back of panel. Note that all welded edges must be rounded and smooth so that concrete does not 'catch' on the inside of the nose when unmolding the front panel.

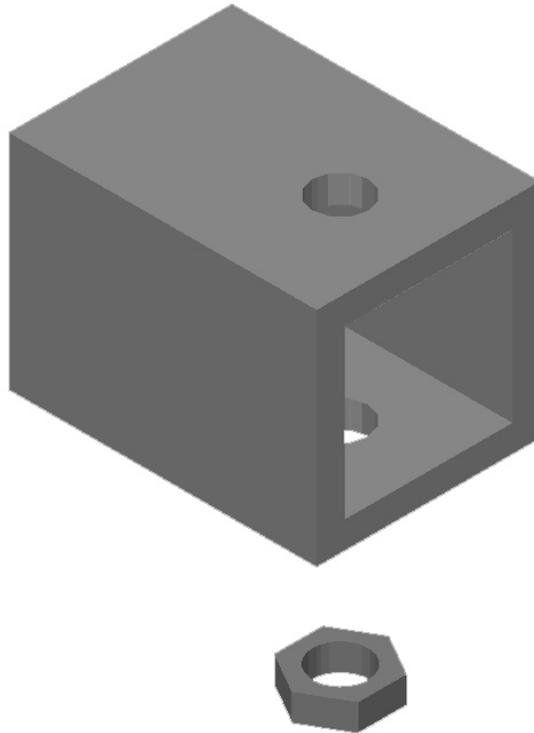


Figure 14a Assembling support for bolt used to clamp nose plate to nose consisting of drilled channel and nut to fit bolt.

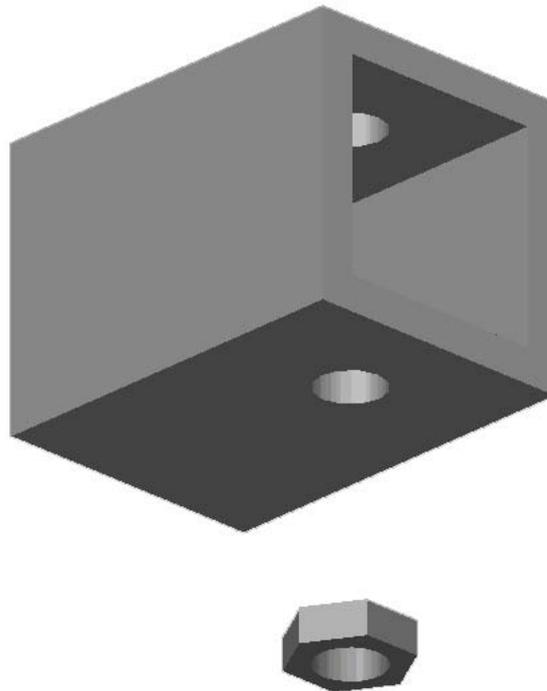


Figure 14b Assembling support for bolt used to clamp nose plate to nose consisting of drilled channel and nut to fit bolt.

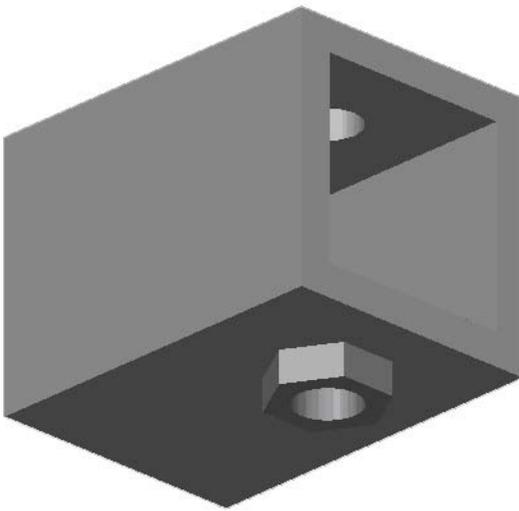


Figure 14c Nut is welded over bottom hole in channel. The threaded bolt can pass through the top hole and turn comfortably in the nut.

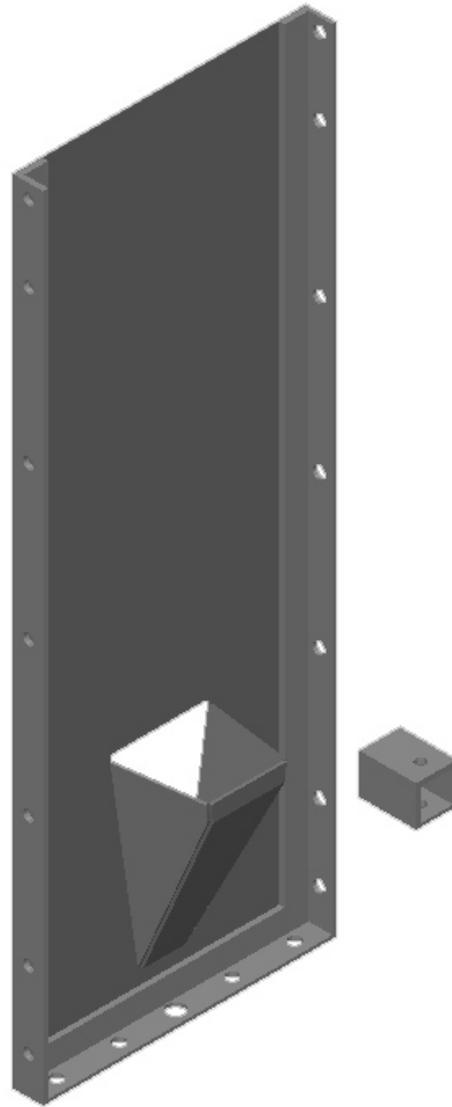


Figure 15a Attaching support to front panel.

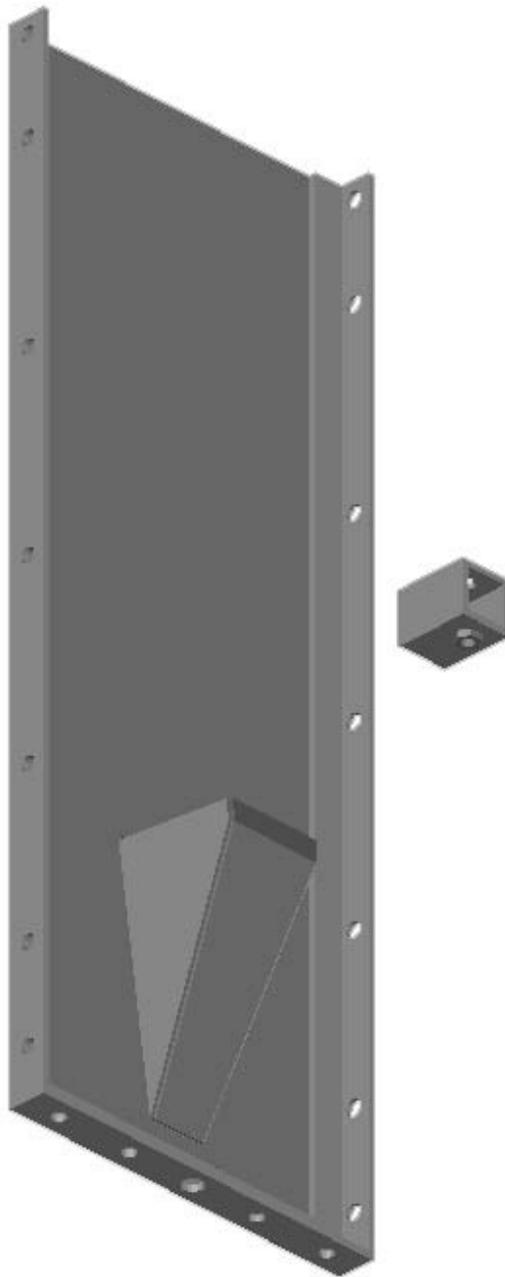


Figure 15b Attaching support to front panel.

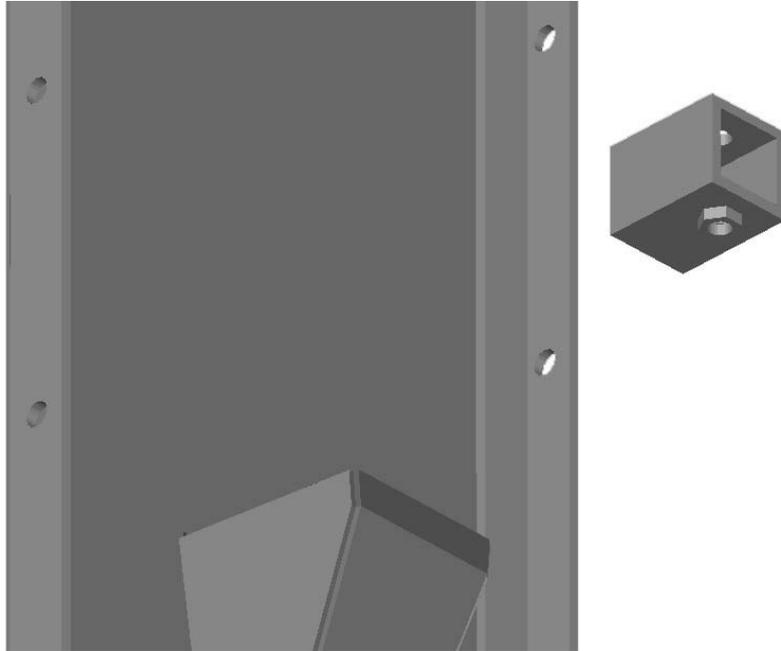


Figure 15c Attaching support to front panel.

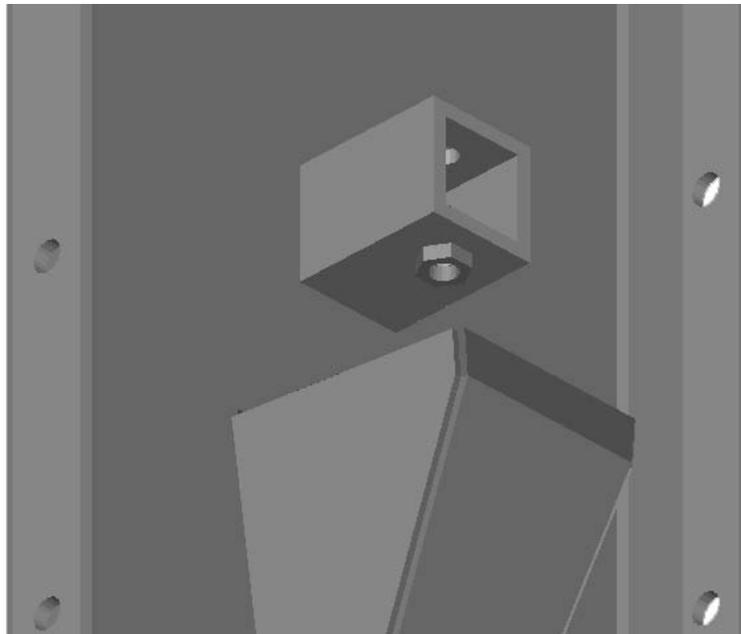


Figure 15d Support is welded to front panel.

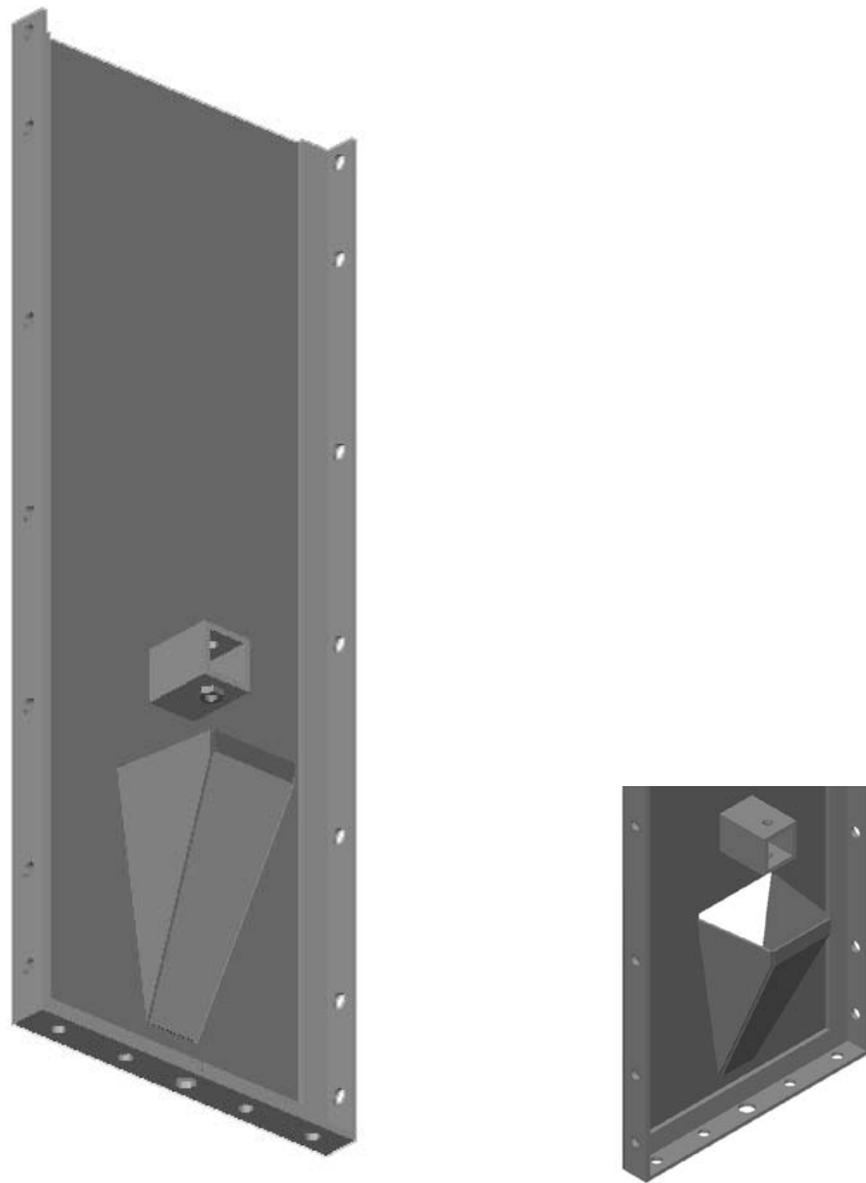


Figure 15e Support welded to front panel.

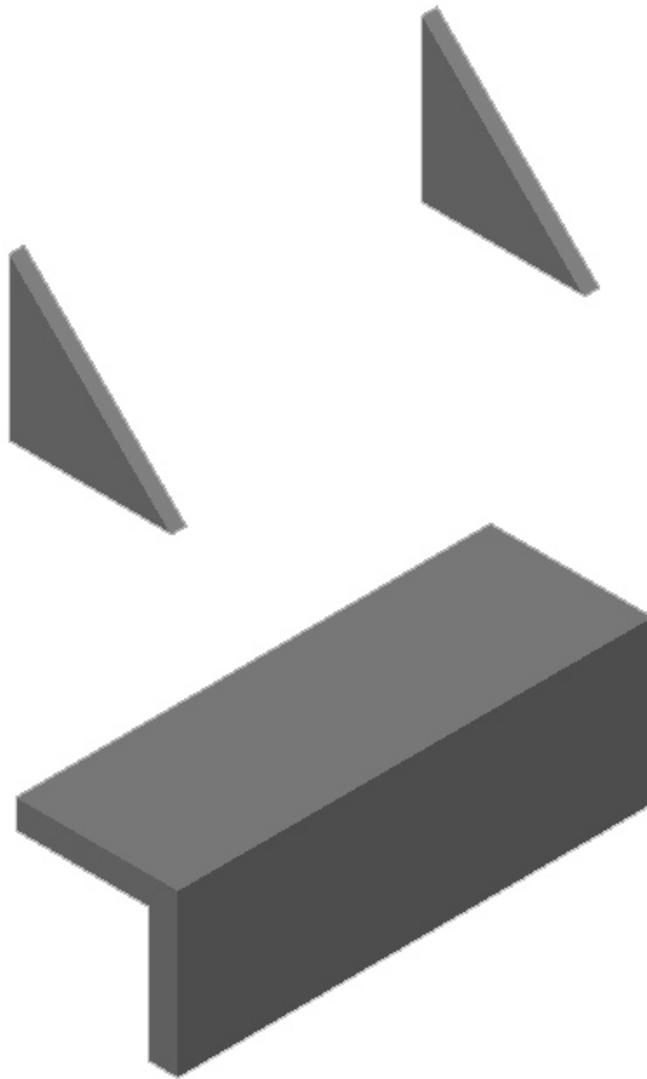


Figure 16a Elements of puller support on front panel.

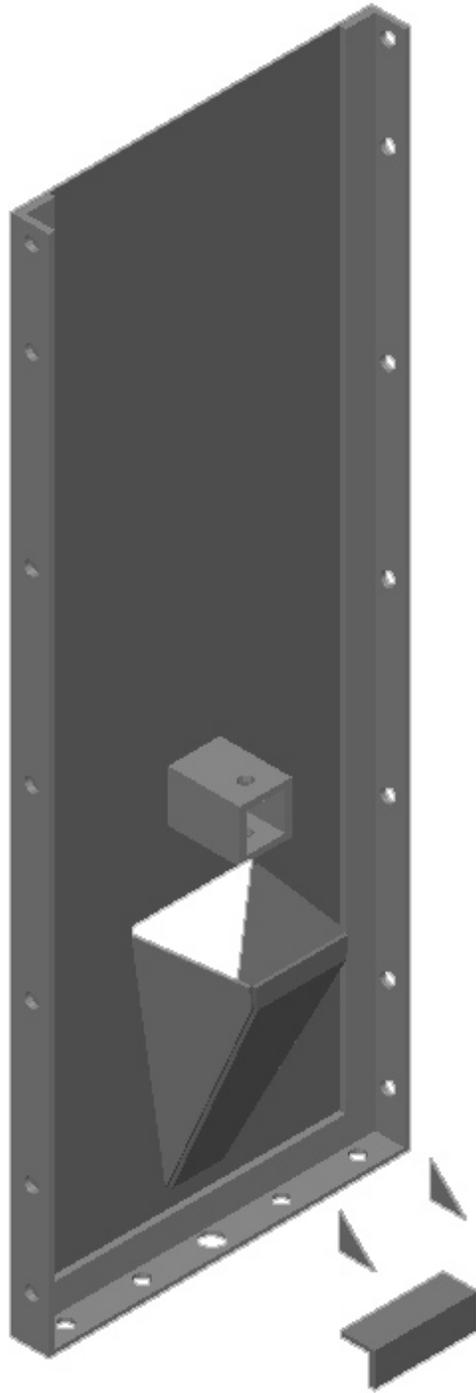


Figure 16b Assembling puller support on front panel.

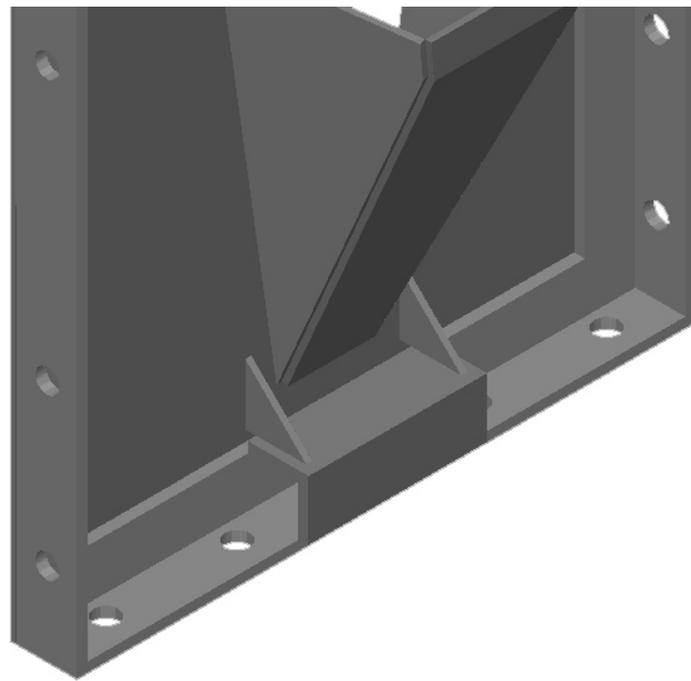
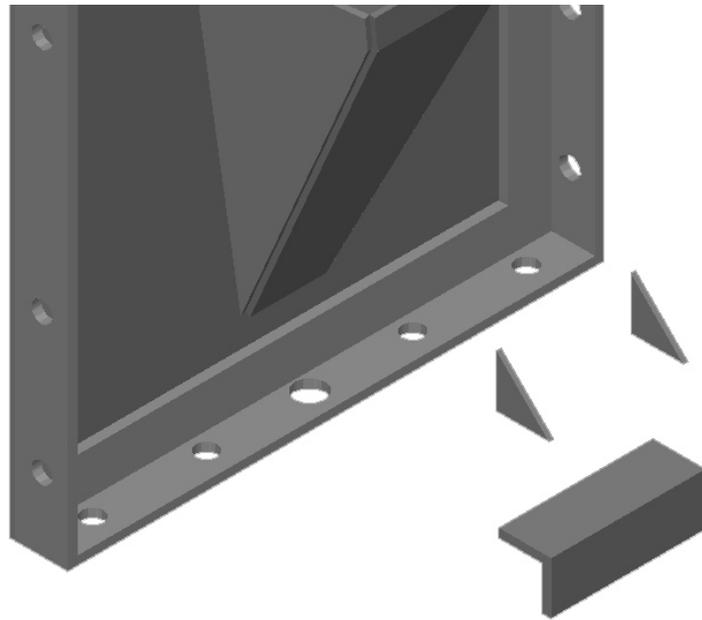


Figure 16c Attaching puller support on front panel.

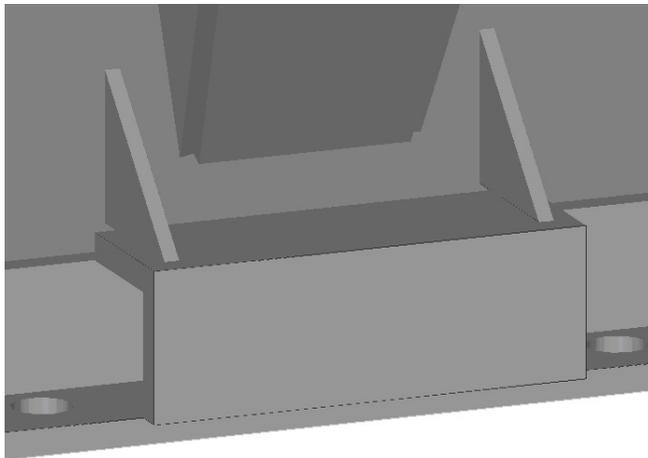
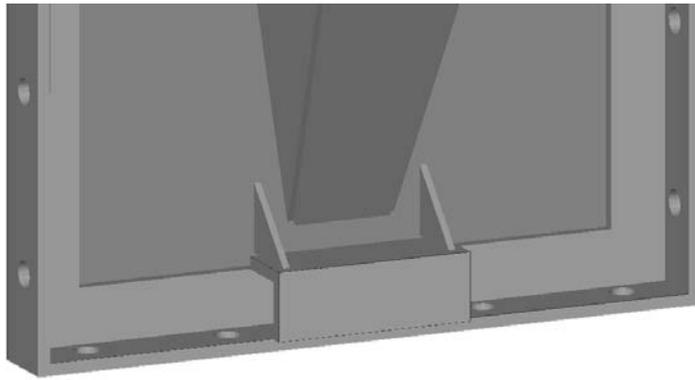
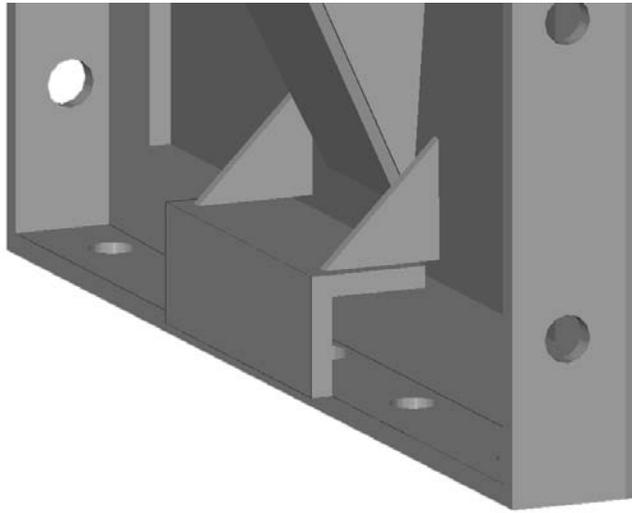


Figure 16d Attaching puller support on front panel.

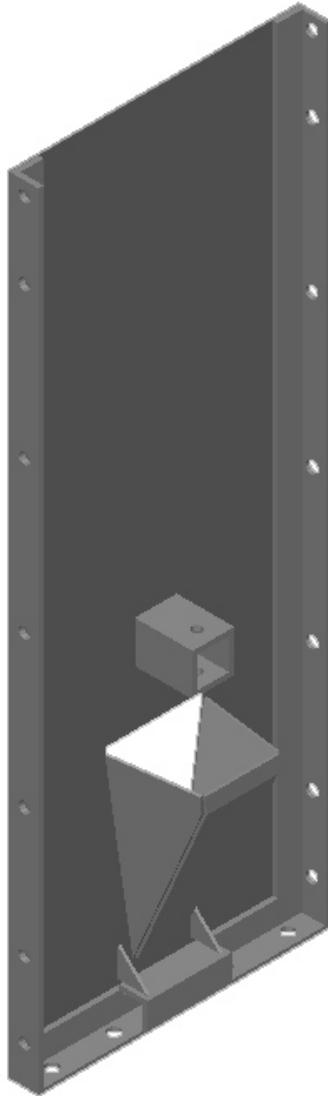


Figure 16e Puller support welded on front panel.

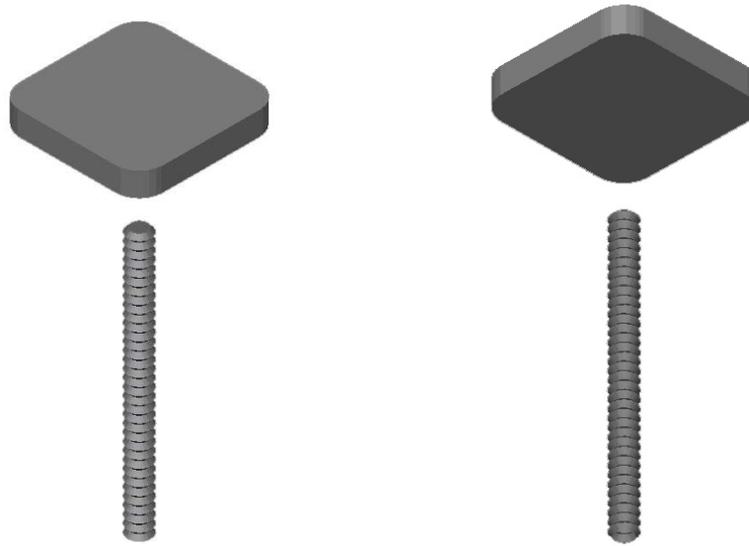


Figure 17a Elements of bolt used for clamping down the nose plate.

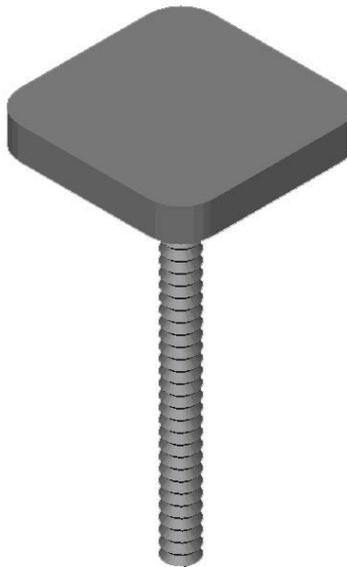


Figure 17b Assembled bolt used for clamping down the nose plate. Threaded rod to fit nut in support is welded to top piece.

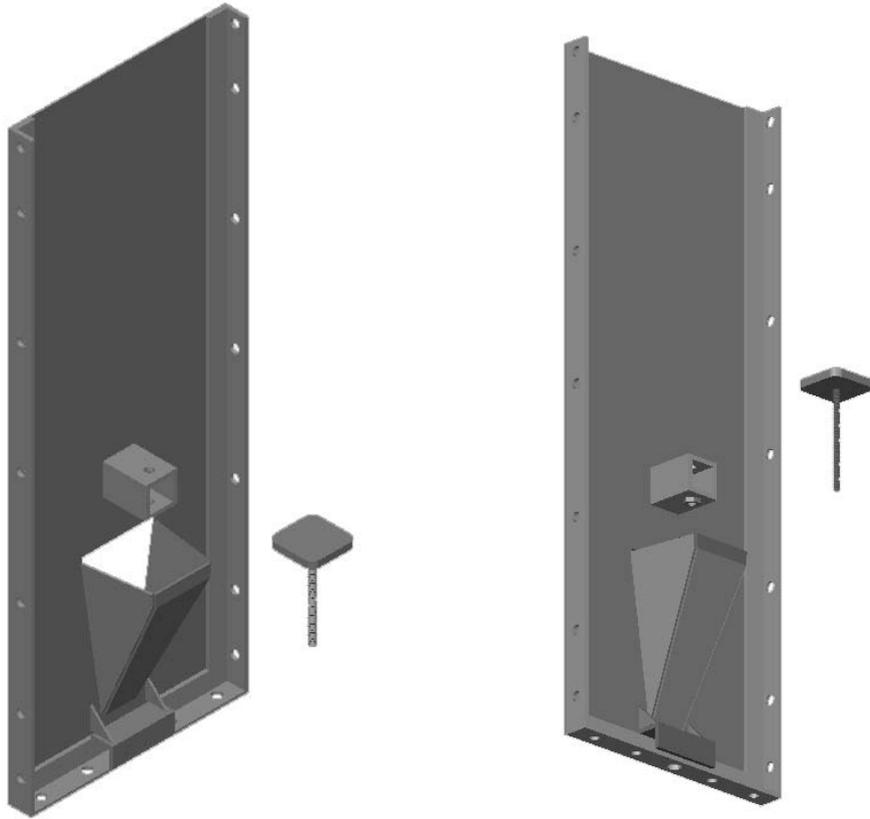


Figure 17c Bolt used for clamping down the nose plate.

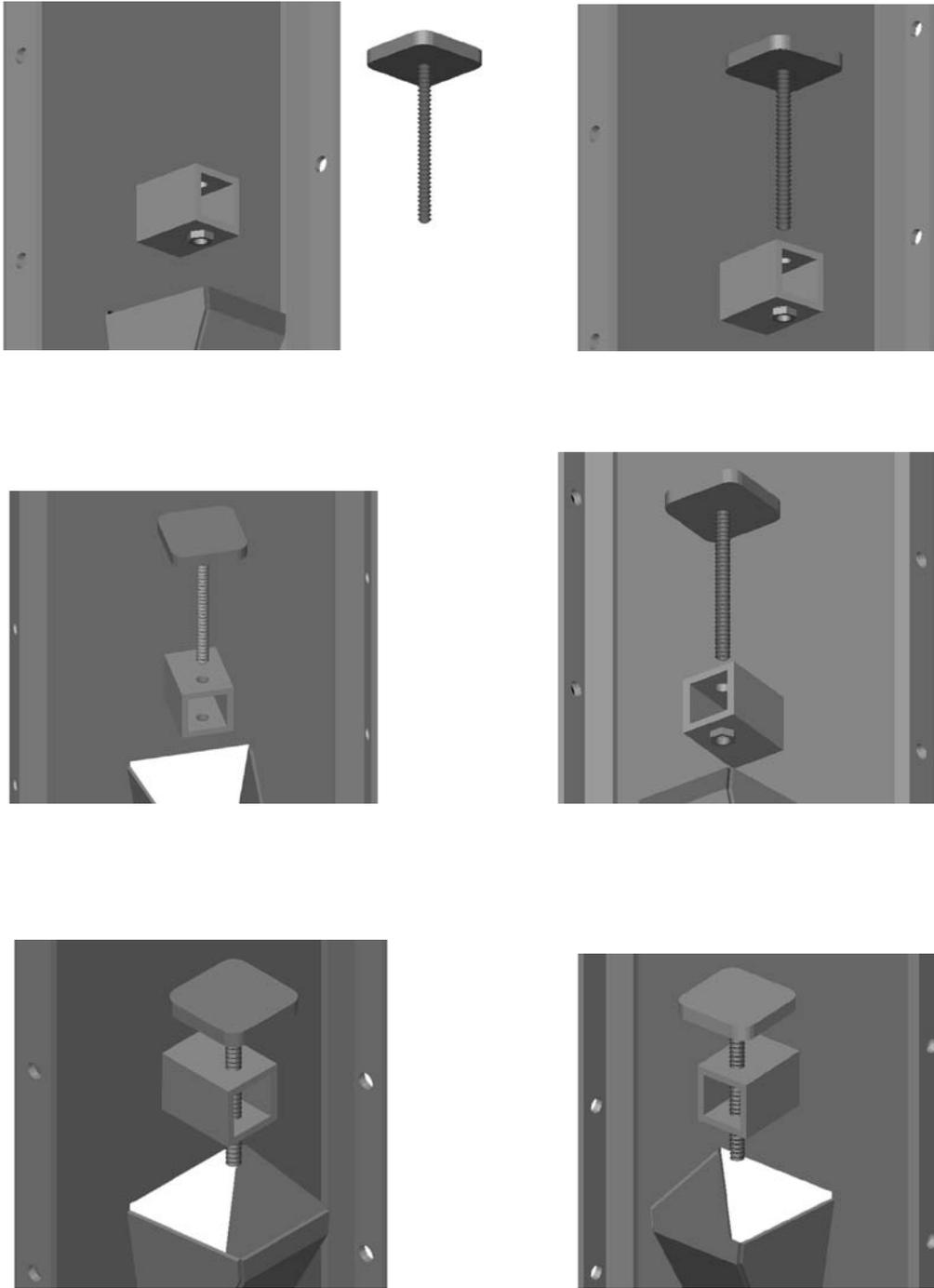


Figure 17d Bolt used for clamping down the nose plate. Note that it easily fits through top hole and is threaded through nut

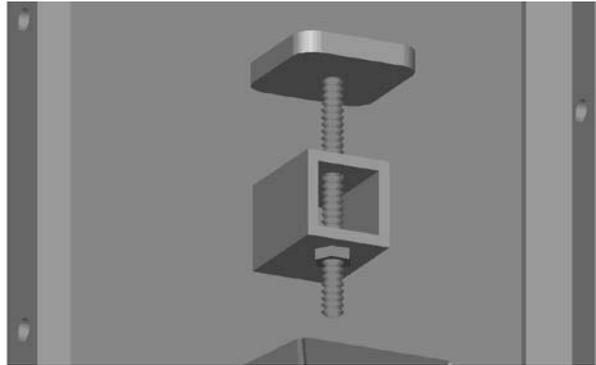


Figure 17e Bolt turned through nut welded to bottom of support.

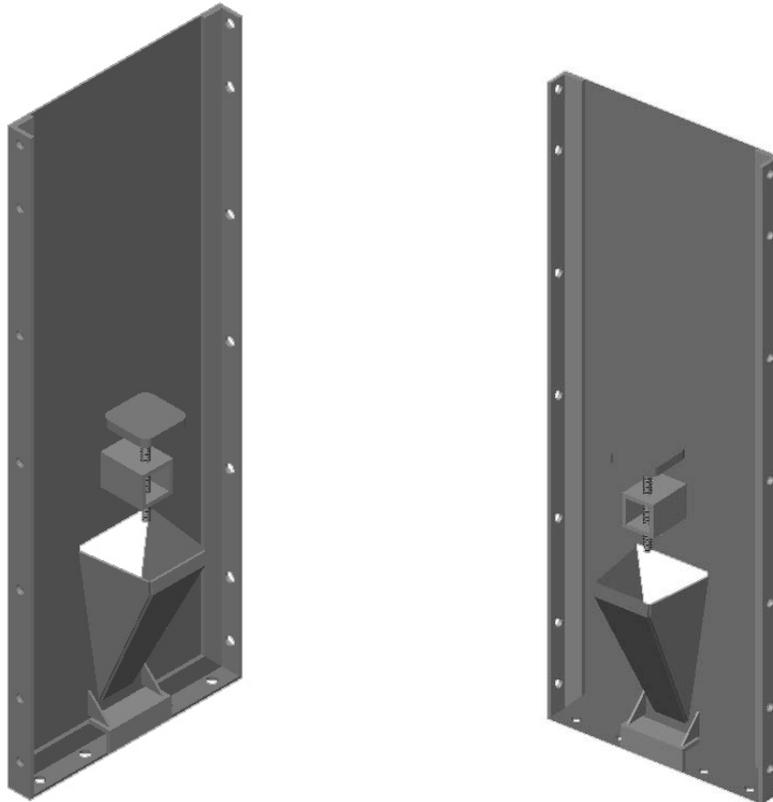


Figure 17f Bolt used for clamping down the nose plate.

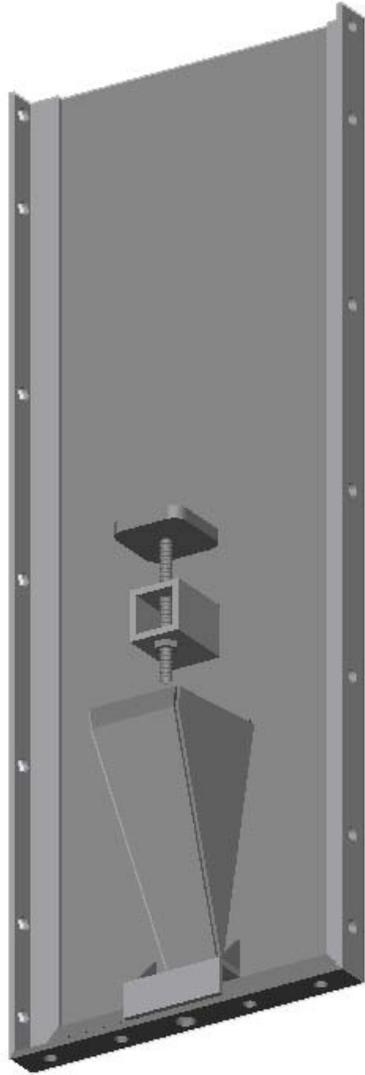


Figure 17g Bolt used for clamping down the nose plate.

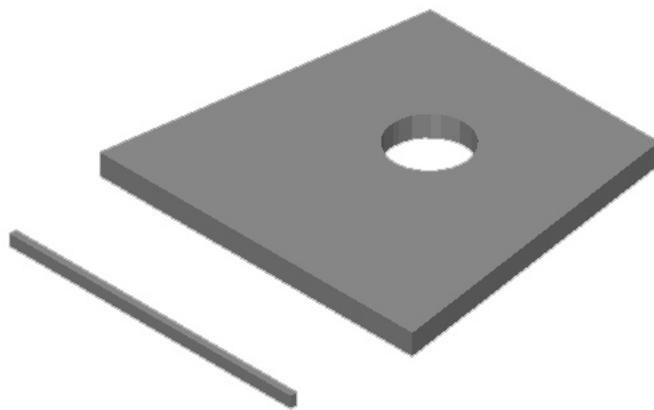
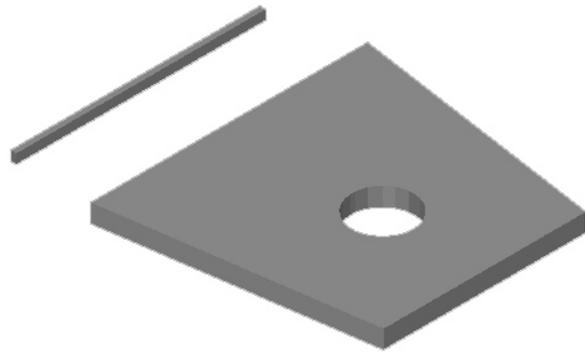


Figure 18a Elements of nose plate.

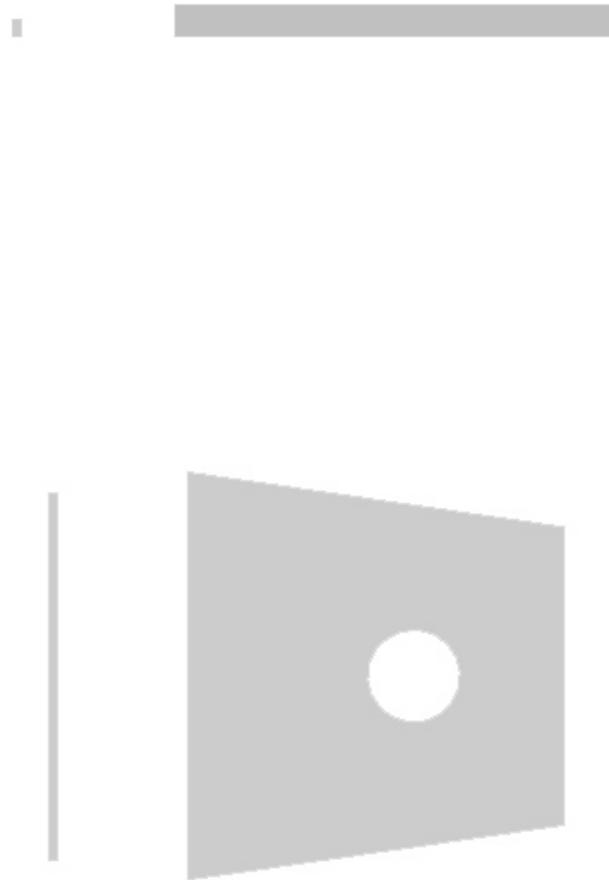


Figure 18b Side and top view of elements of nose plate.

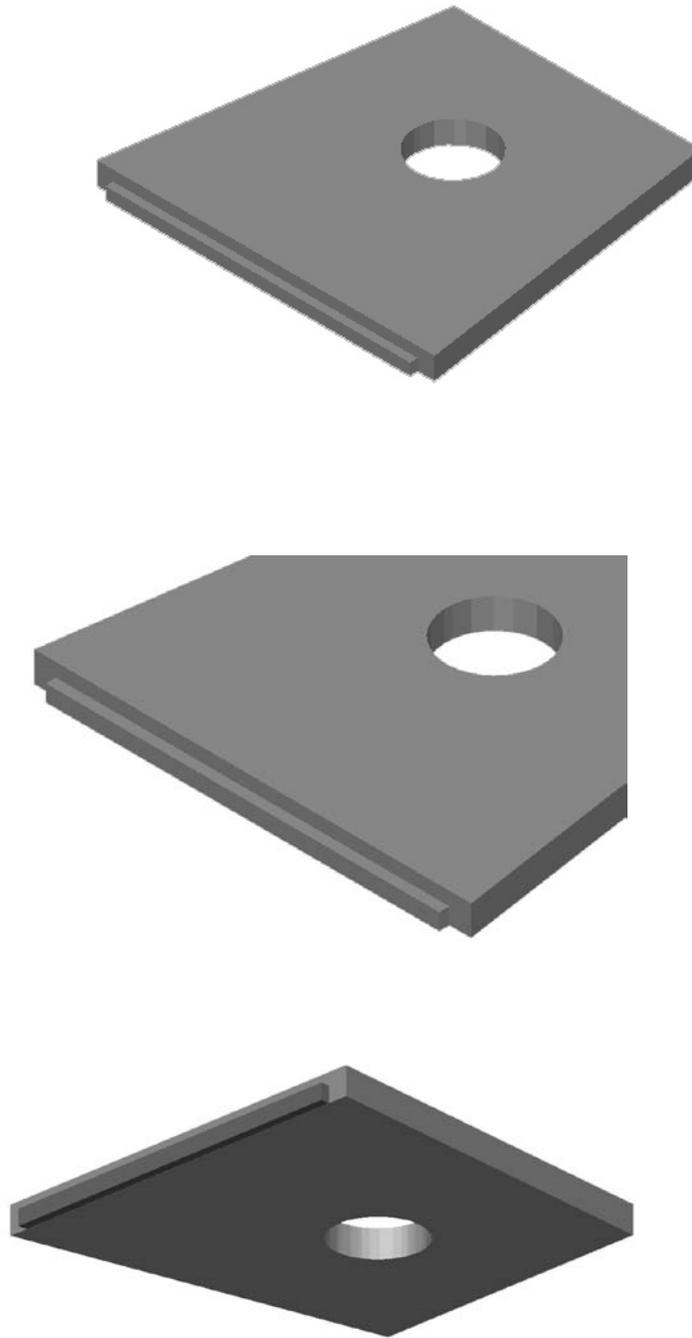


Figure 18c Assembled nose plate. Note that the small ridge must be cleanly ground to show sharp edges and corners after being welded to larger plate.

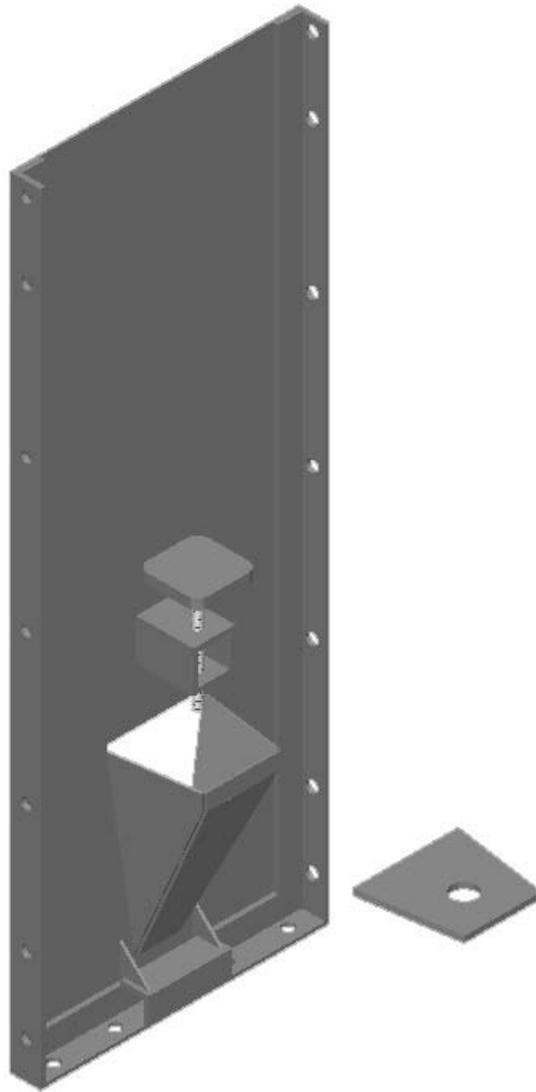


Figure 18d Locating nose plate.

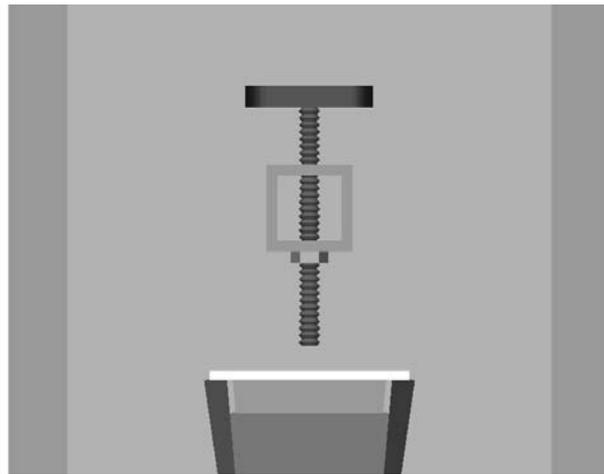
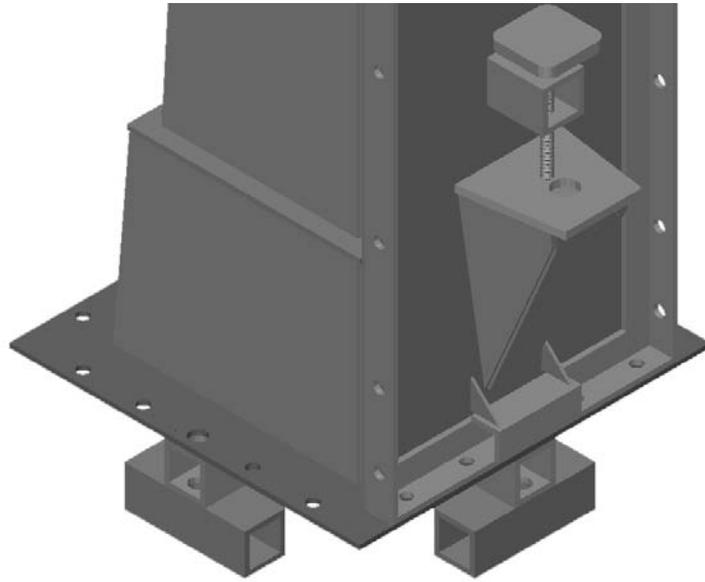


Figure 18e Locating nose plate.

### 3.2 Back Panel



Figure 19a Assembling the front panel - attaching angle iron.

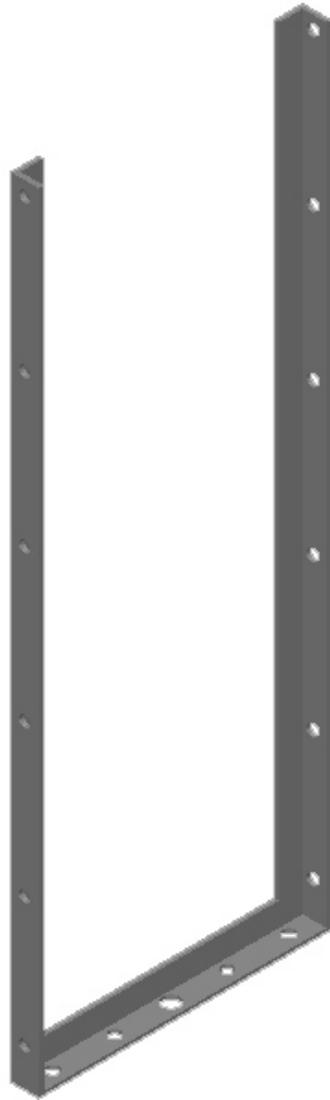


Figure 19b Assembling the front panel - attaching angle iron.

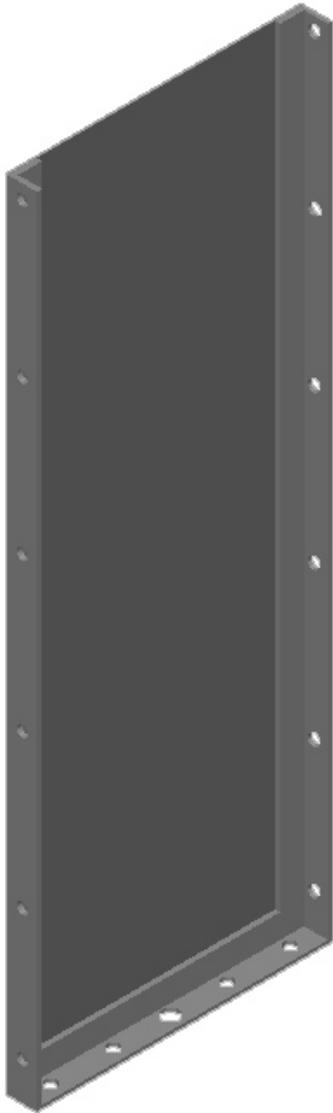


Figure 19c Assembling the back panel - attaching angle iron.

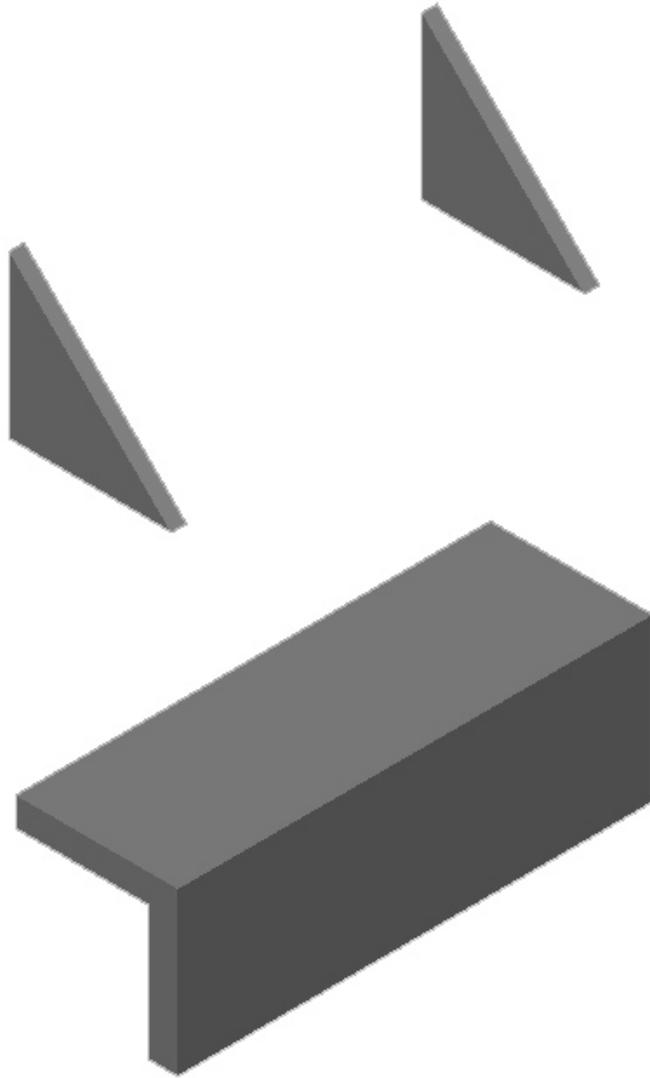


Figure 20a Elements of puller support on back panel.

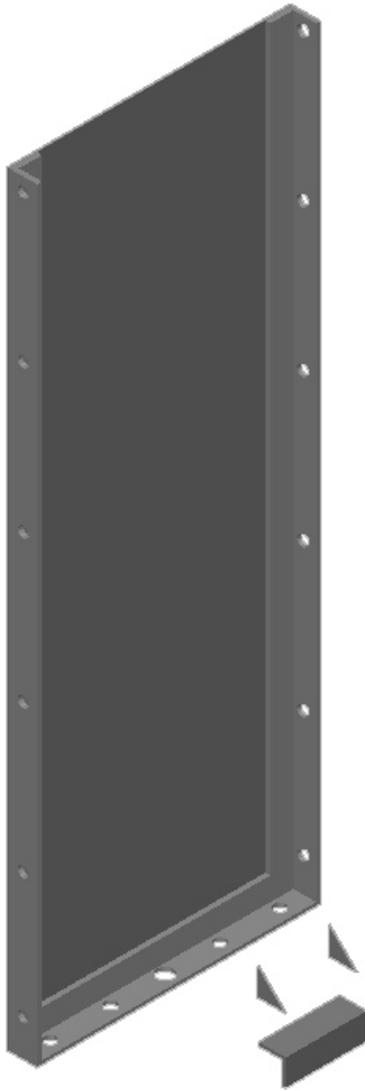


Figure 20b Elements of puller support on back panel.

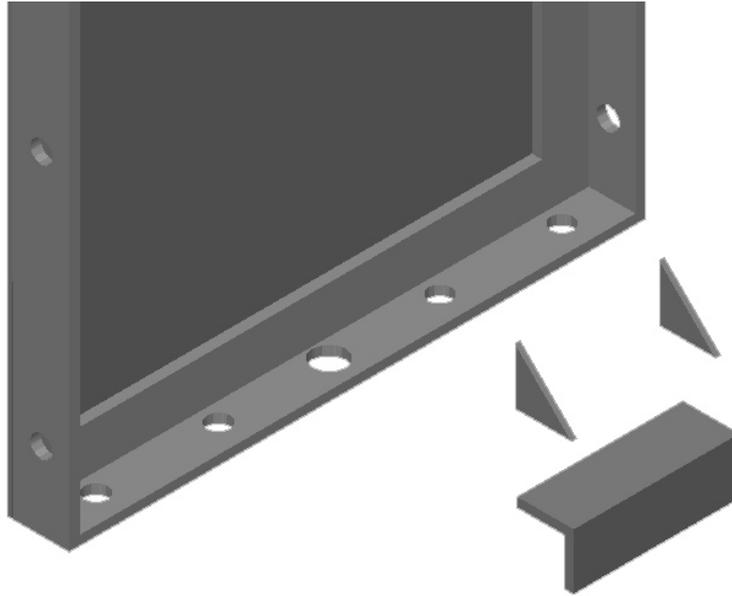


Figure 20c Elements of puller support on back panel.

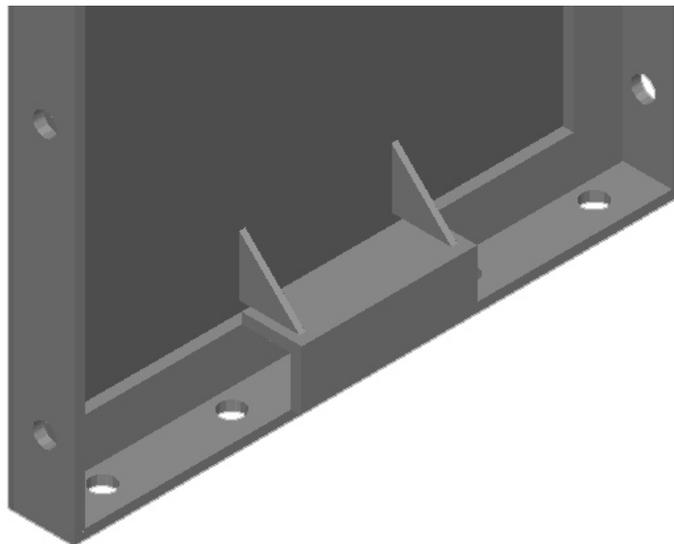


Figure 20d Puller support welded to back panel.

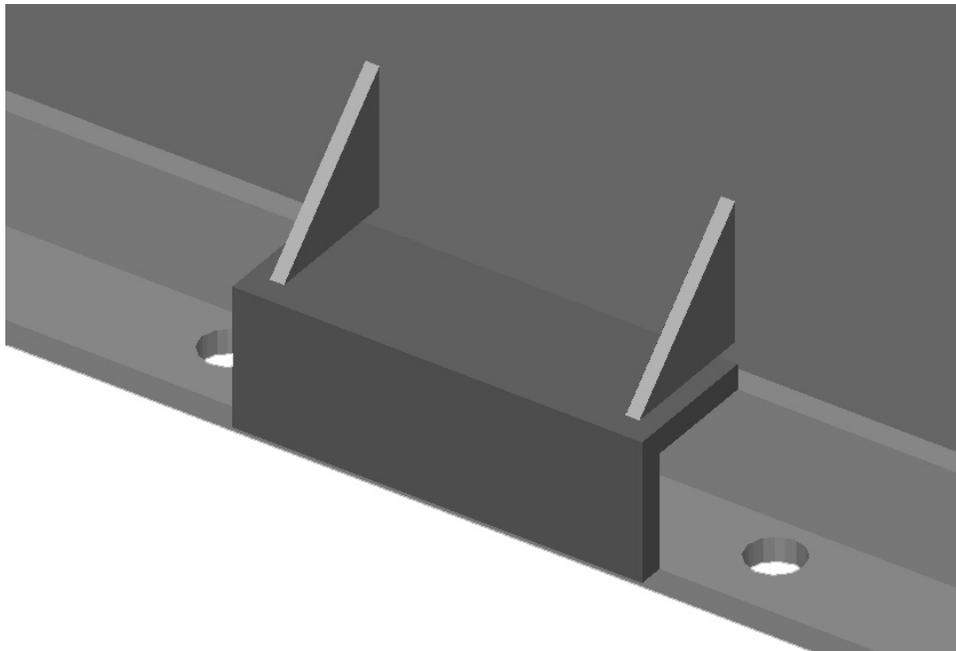
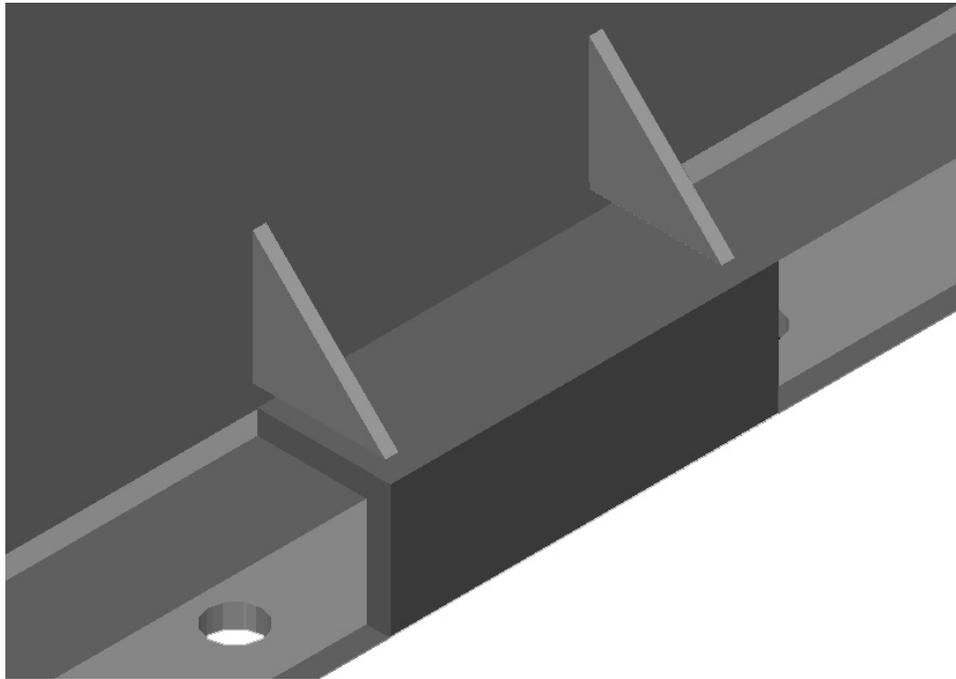


Figure 20e Puller support welded to back panel.

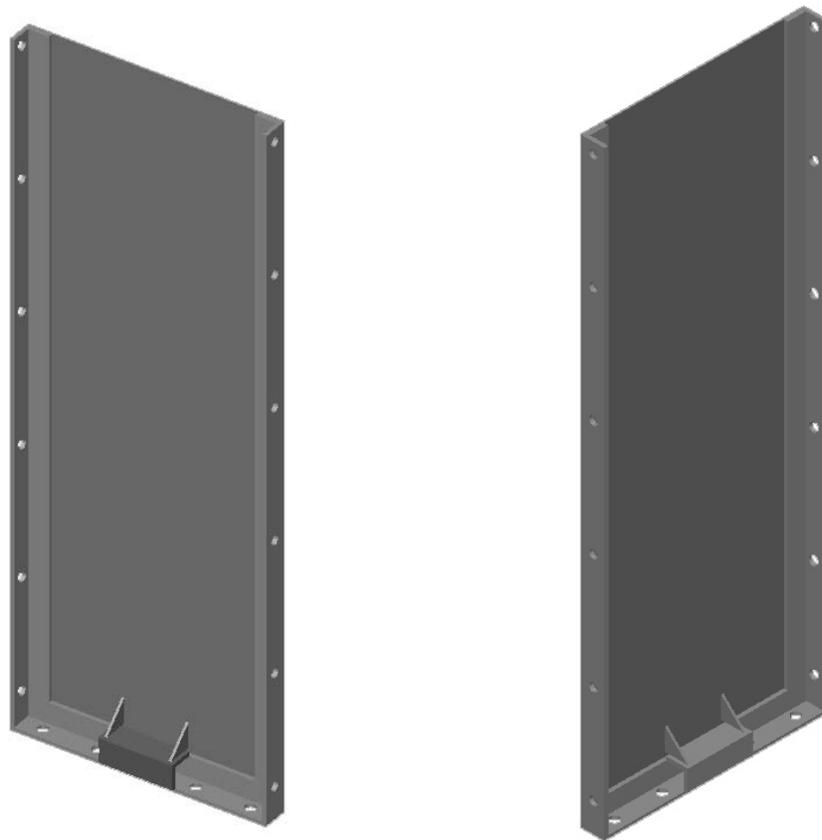


Figure 20f Puller support welded to back panel.

### 3.3 Left Panel



Figure 21a Elements of left panel.

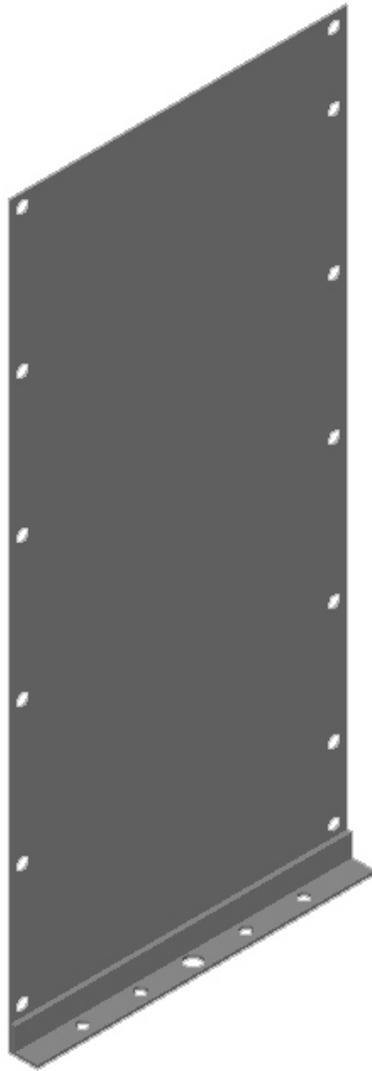


Figure 21b Left panel assembled.

### 3.4 Right Panel



Figure 22a Elements of right panel.



Figure 22b Right panel assembled.

#### 4. Interior Mold

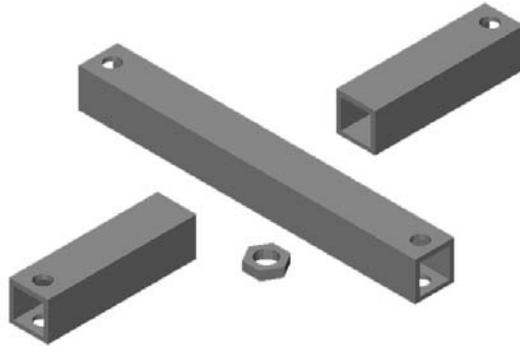


Figure 23a Elements of base of interior mold. Note that the nut is simply welded to the exact centre of the base and that there is no hole drilled through the base. The nut is sized to match the large puller bolt. Care must be taken to avoid damaging threads in nut.

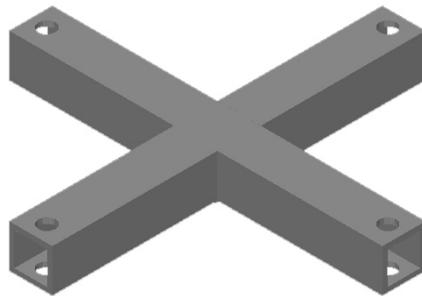


Figure 23b Elements of base of interior mold assembled.

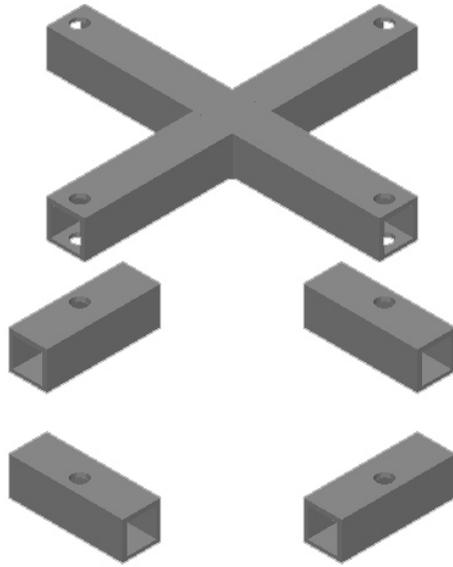


Figure 23c Elements of base of interior mold.

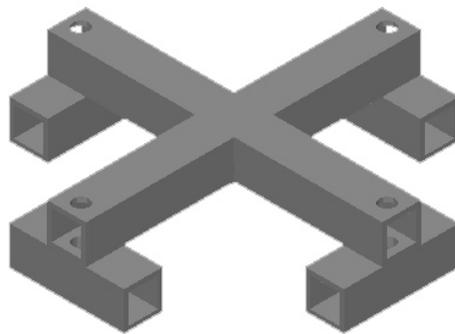


Figure 23d Elements of base of interior mold assembled.

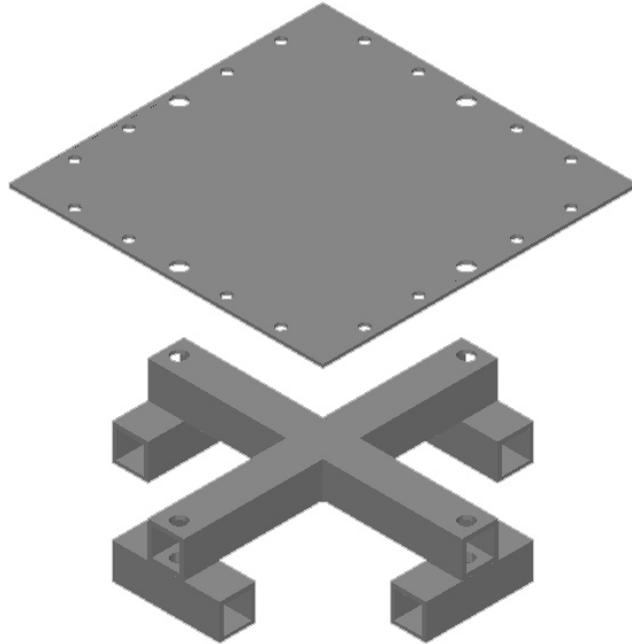


Figure 23e Attaching base of interior mold to base plate.

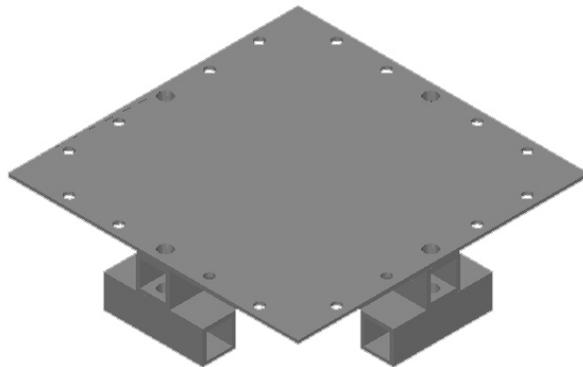


Figure 23f Base of interior mold attached to base plate.

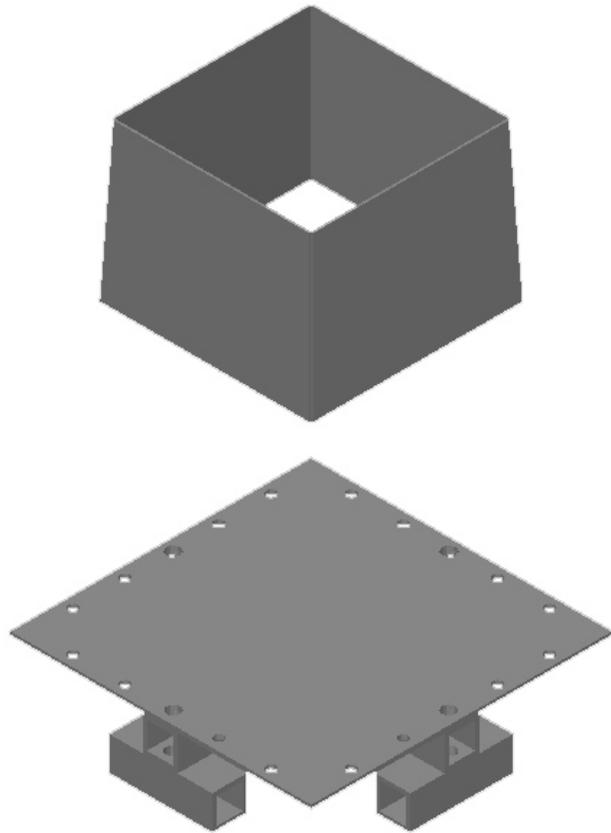


Figure 23g Attaching bottom section of interior mold to base plate.

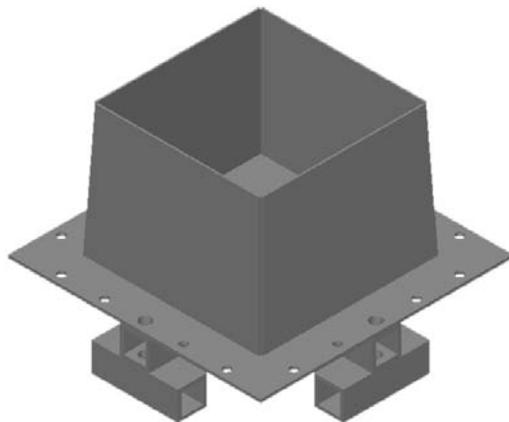


Figure 23h Bottom section of interior mold attached to base plate.

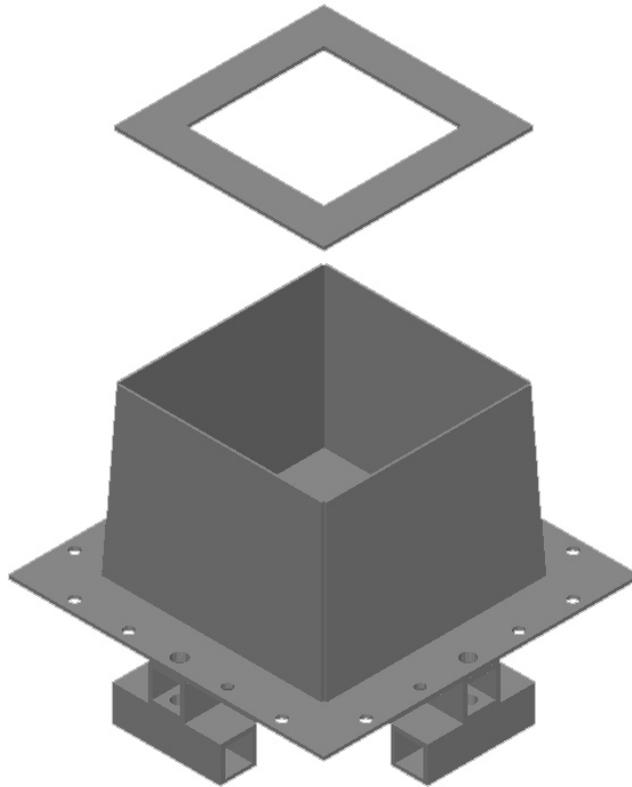


Figure 23i Attaching top of bottom section of interior mold to bottom section.

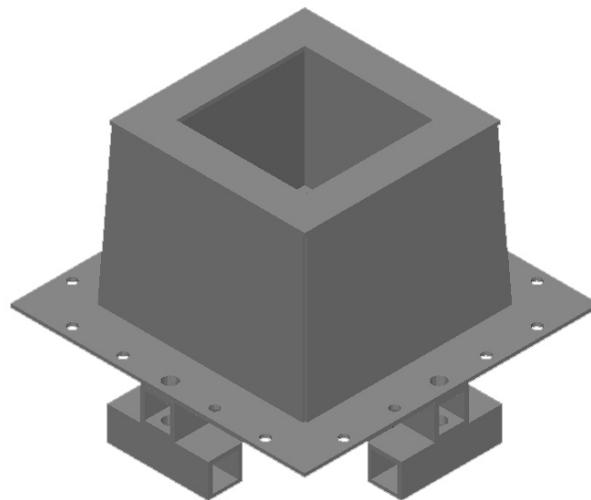


Figure 23j Top of bottom section of interior mold attached to bottom section.

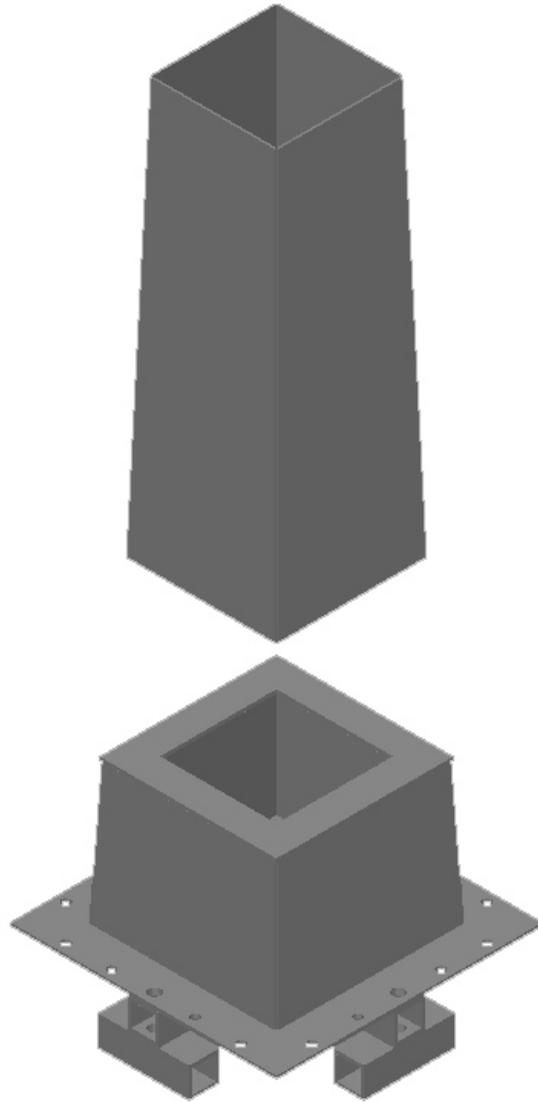


Figure 23k Attaching top section of interior mold to bottom section.

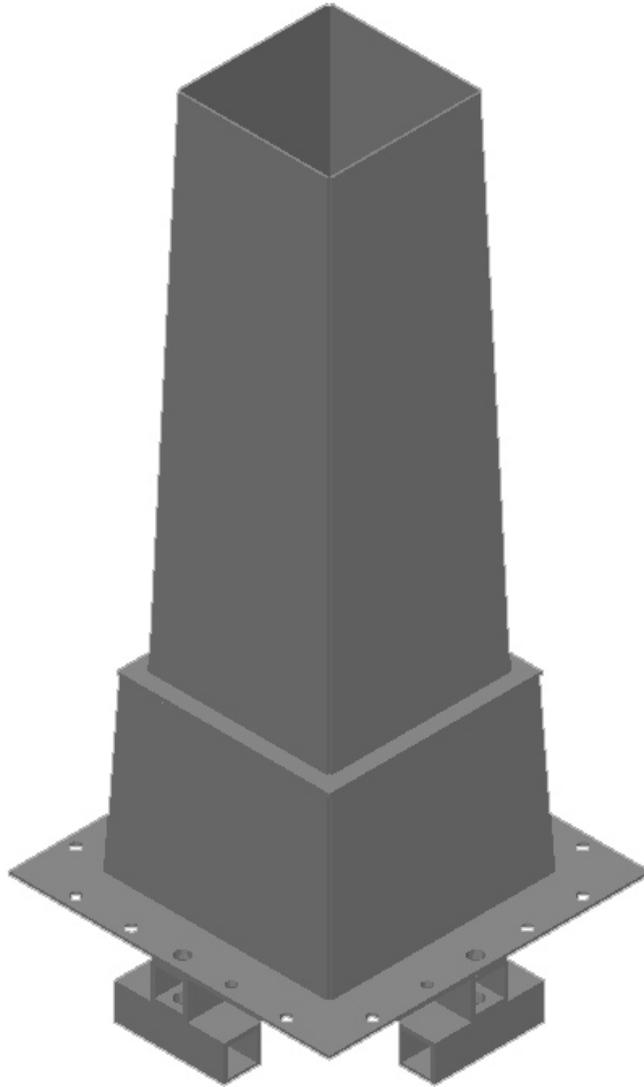


Figure 231 Top section of interior mold attached to bottom section.

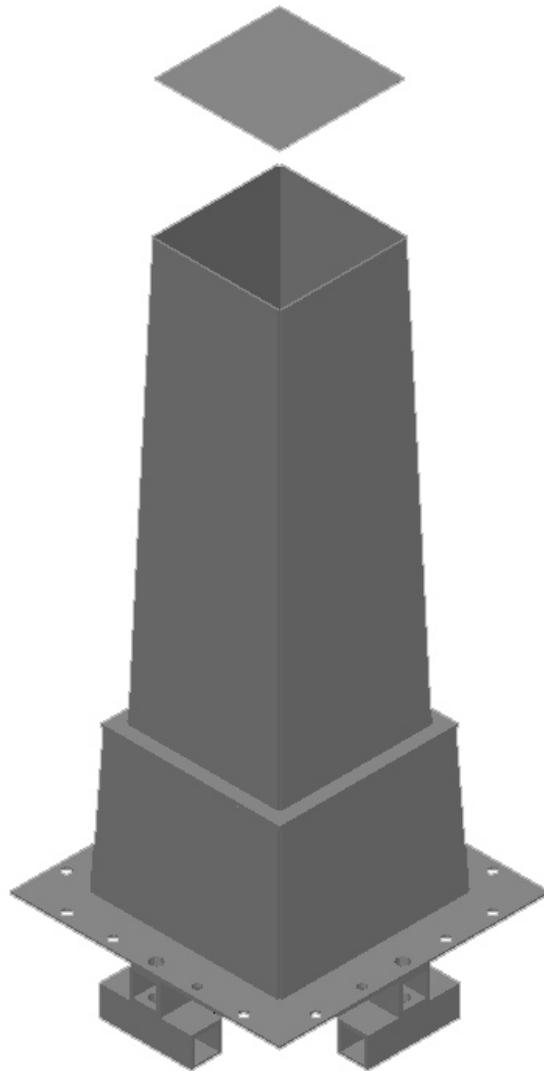


Figure 23m Attaching top plate of interior mold.

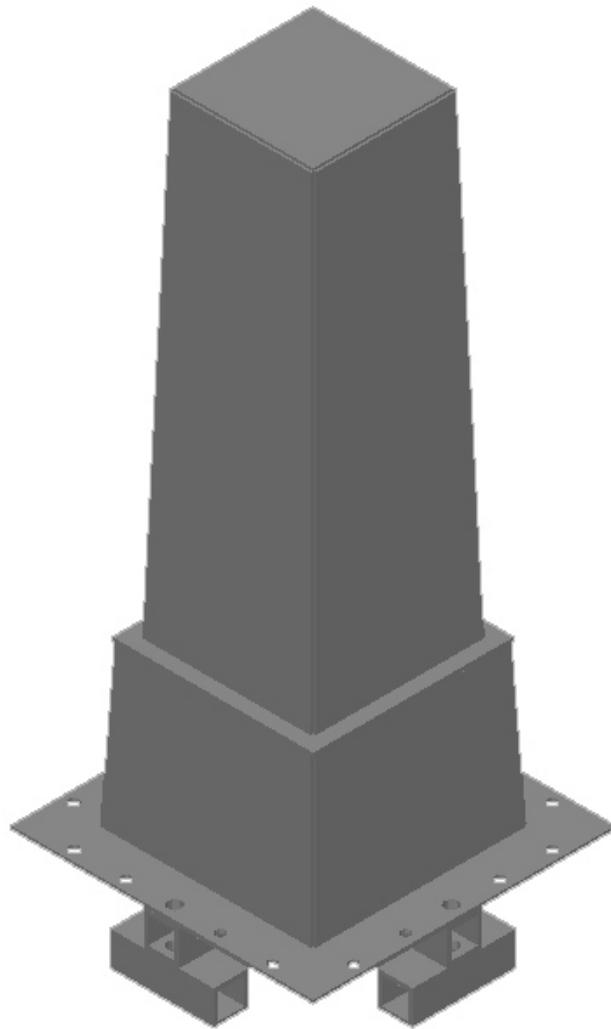


Figure 23n Top plate of interior mold attached.

**Note: 1.All welds must rounded and smooth.**

**2. All of the side panels must be perfectly smooth and flat without any indents (dimples) or elevations (pimples).**

## 5 Mold Puller

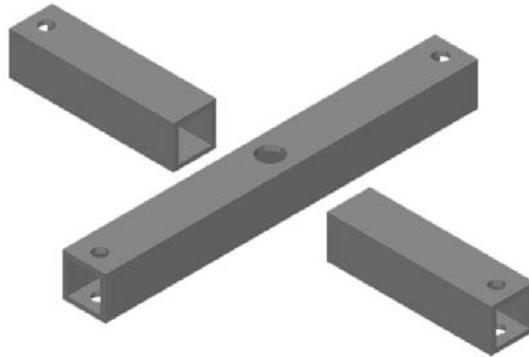


Figure 24a Elements of mold puller frame. Note that hole is slightly larger than diameter large puller bolt.

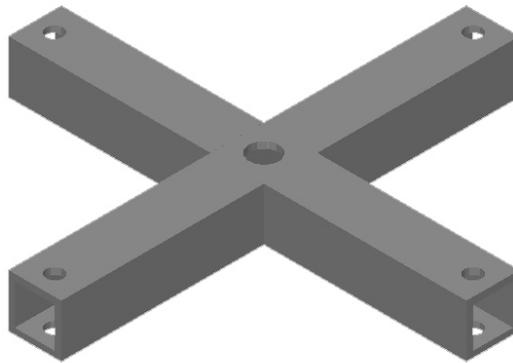


Figure 24b Elements of mold puller frame assembled- top view.

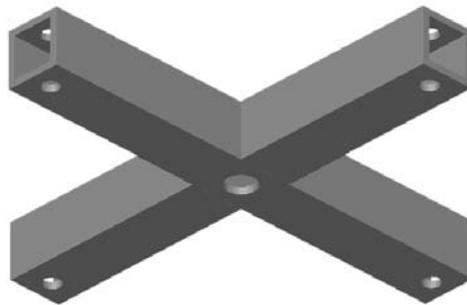


Figure 24c Elements of mold puller frame assembled- bottom view.

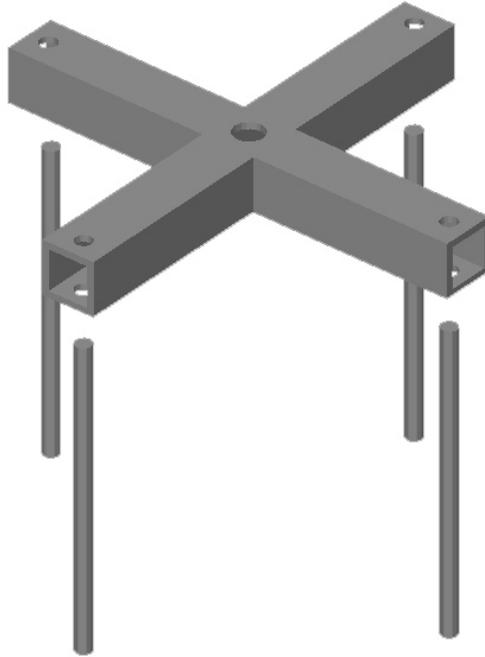


Figure 24d Mold puller frame with legs.

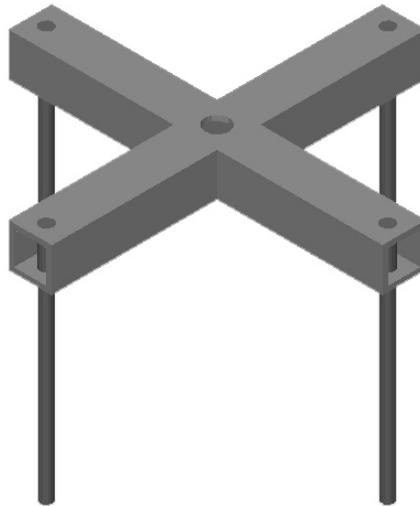


Figure 24e Mold puller frame with legs attached. Note legs fully penetrate the frame through holes and are welded to frame at the top and bottom of the frame.

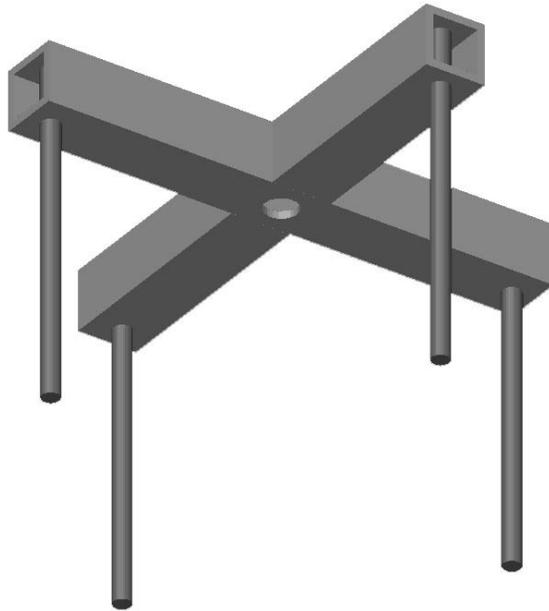


Figure 24f Mold puller frame with legs attached. Note legs fully penetrate the frame through holes and are welded to frame at the top and bottom of the frame.

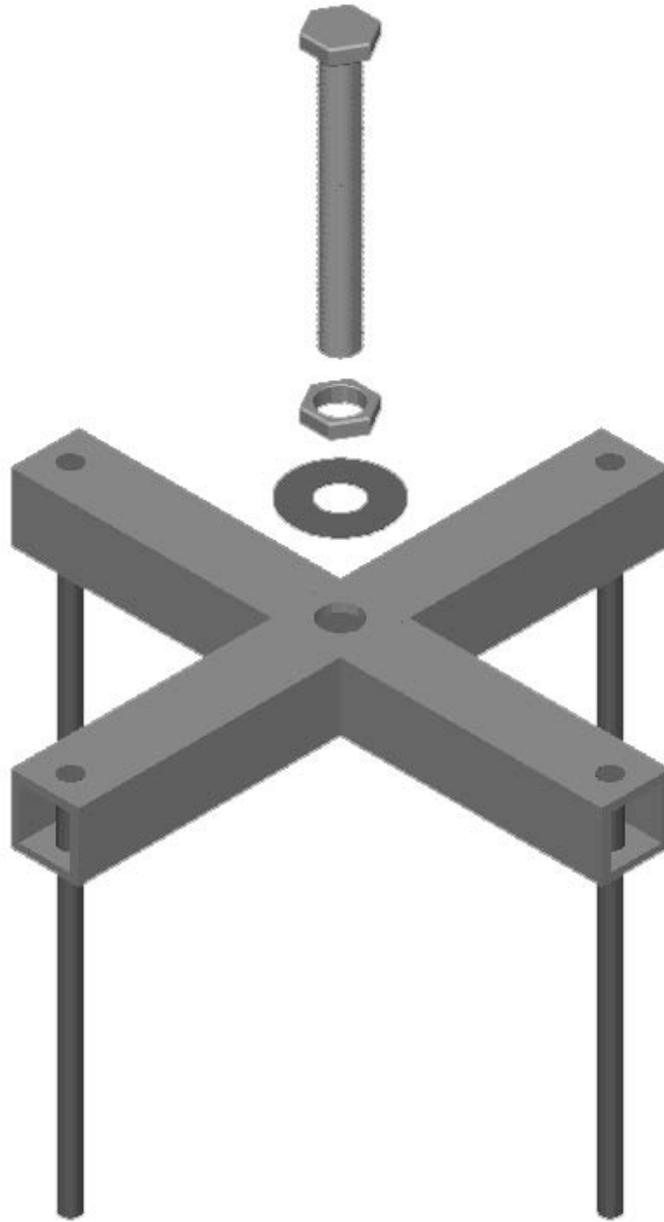


Figure 24g Large puller bolt with nut and washer.

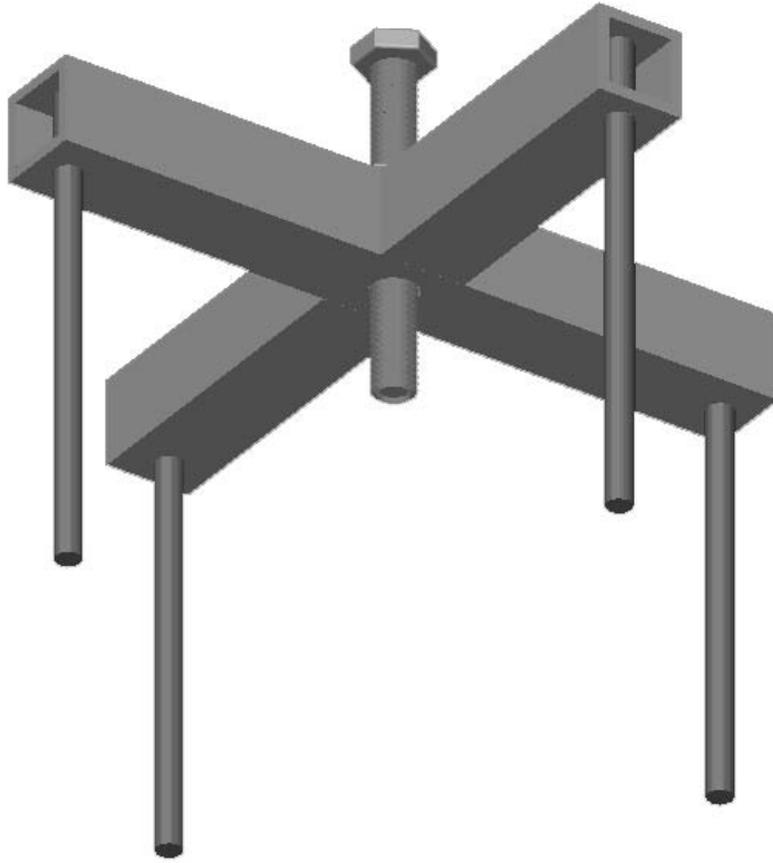


Figure 2h Large puller bolt with nut and washer.