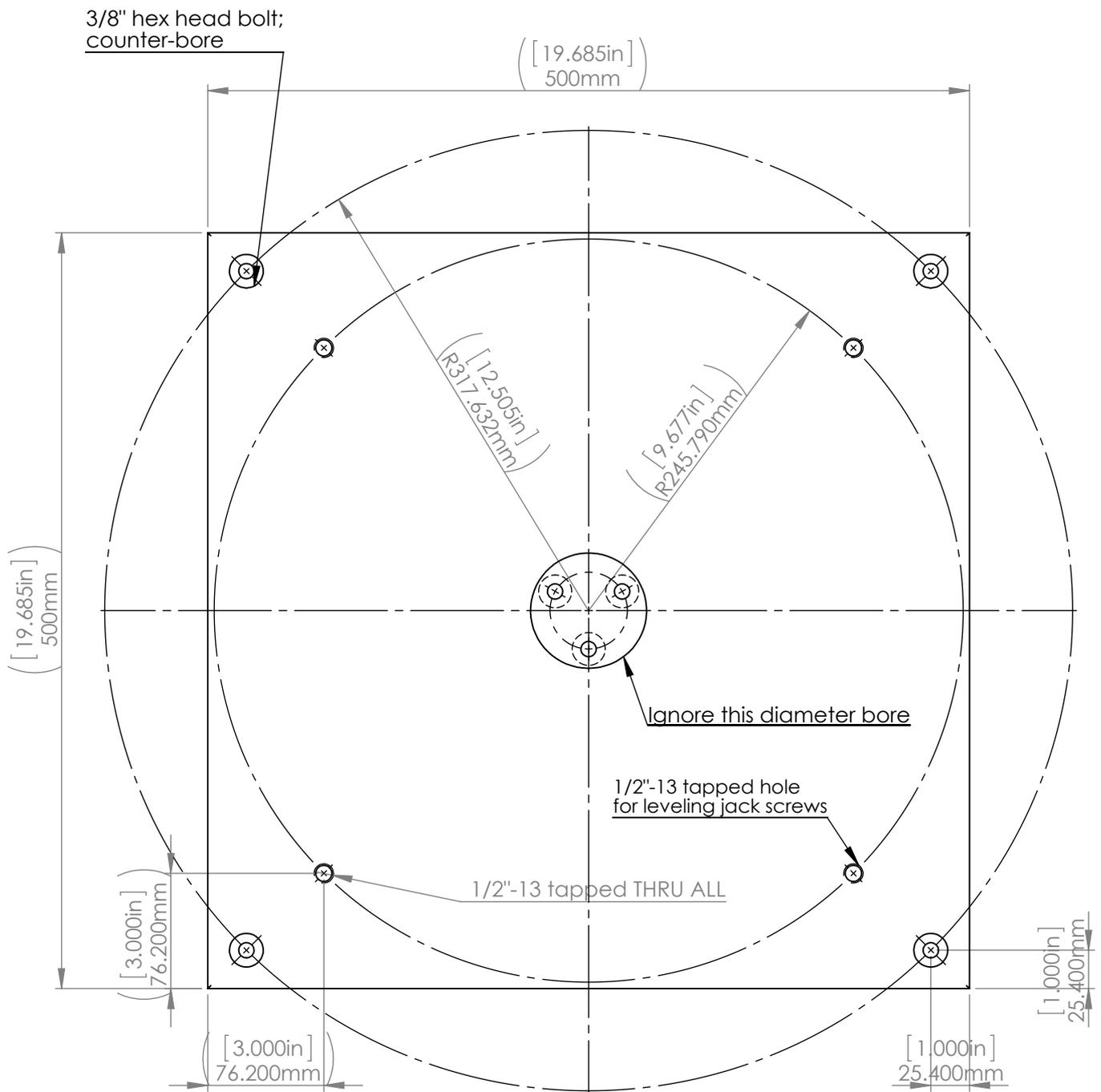
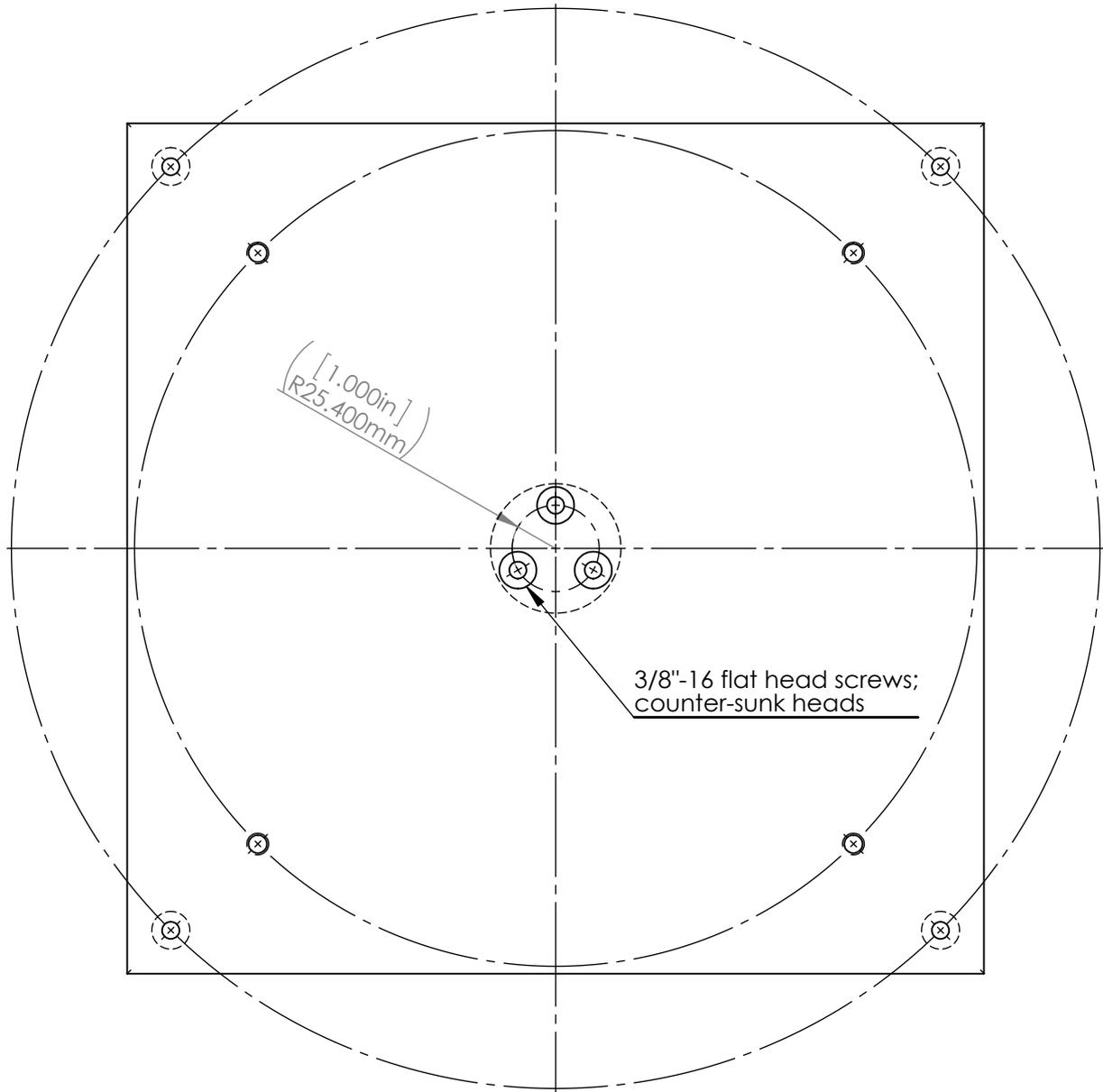


VIEW: FRONT		NOTES:	
DRAWN BY	NAME	DATE	
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 		PART: Tidal Turbine Support Tower Assembly Aluminum	
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)		U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



VIEW: TOP		NOTES: Steel base plate, bolted to concrete channel floor. 4 jack screws provide leveling mechanism. 3 counter-sunk screws from bottom of plate attach vertical turbine support post.	
DRAWN BY	NAME	DATE	
  		SolidWorks Student Edition. For Academic Use Only. Steel	
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)		PART: Tidal Turbine Base Plate	
		U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



VIEW: **BOTTOM**

NOTES: Steel base plate, bolted to concrete channel floor. 4 jack screws provide leveling mechanism. 3 counter-sunk screws from bottom of plate attach vertical turbine support post.

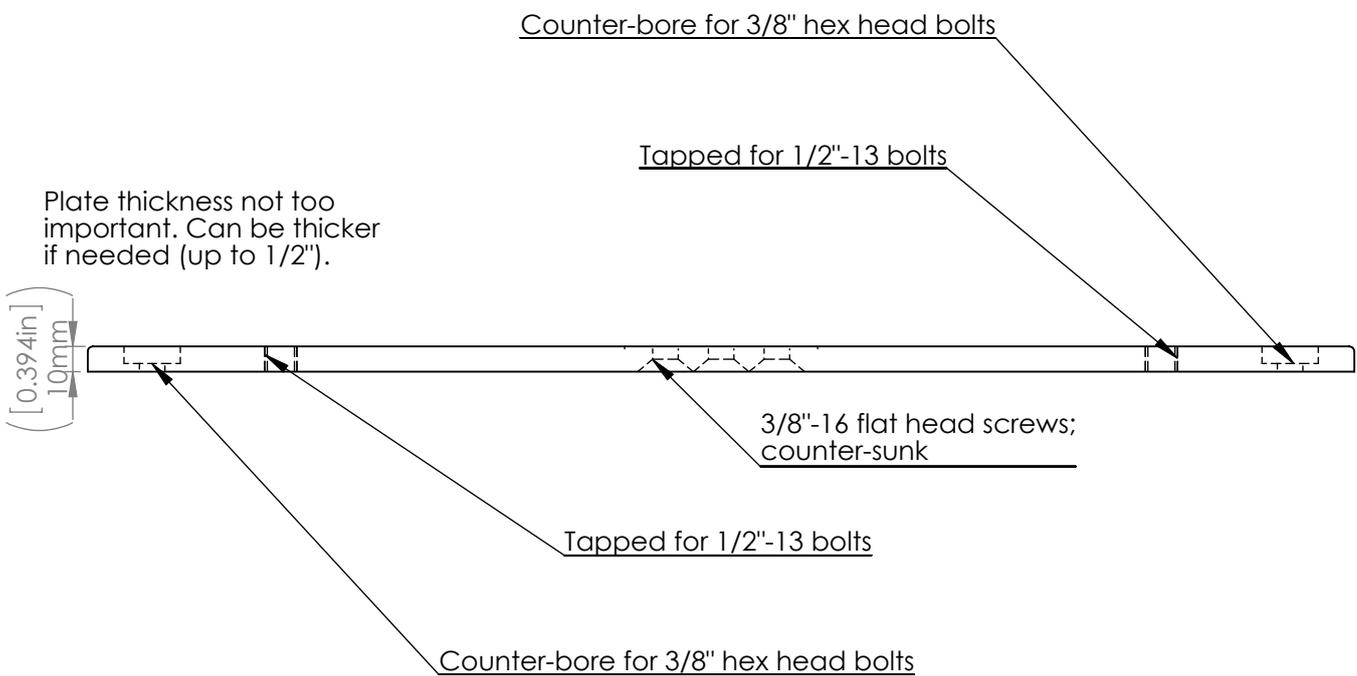
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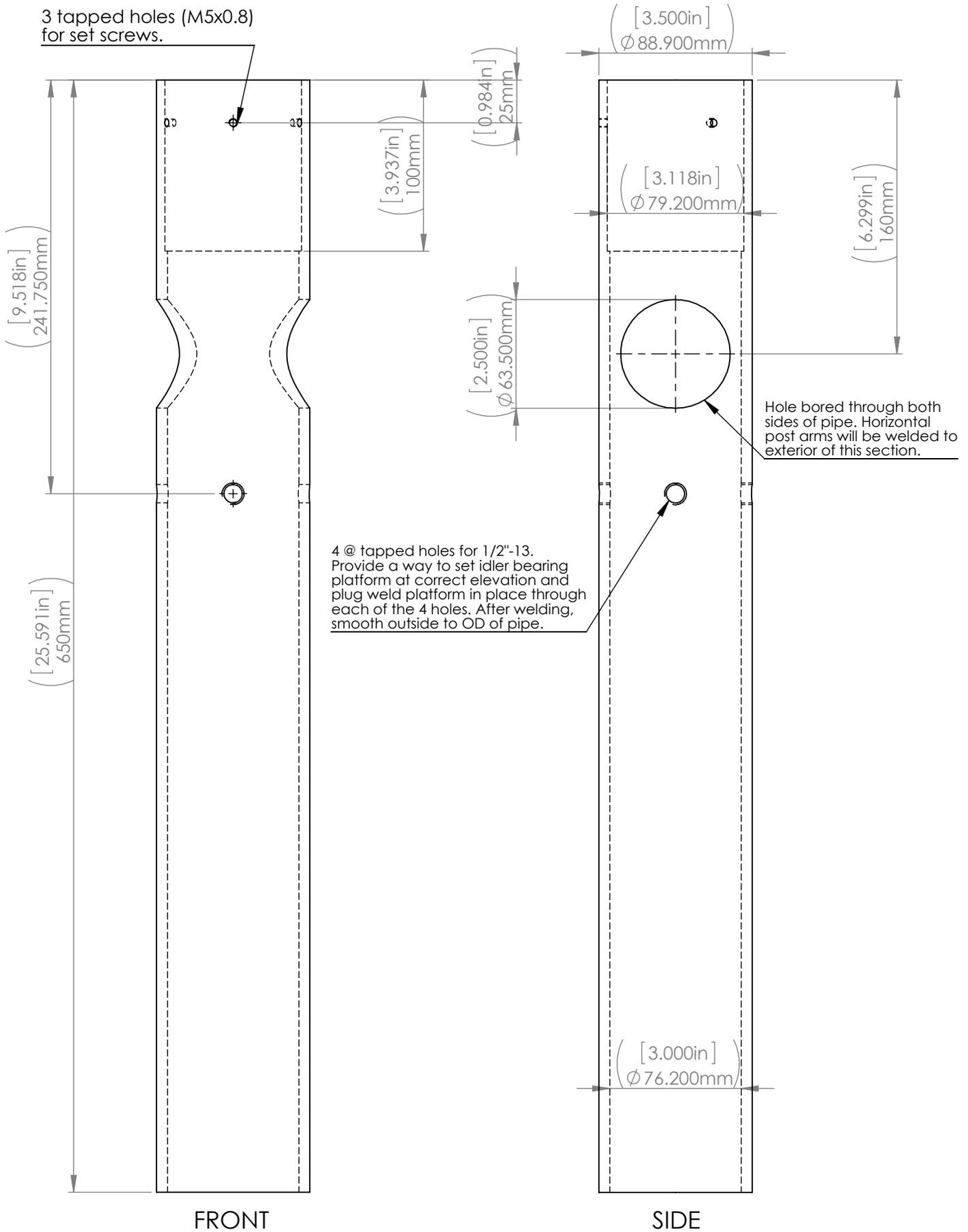


MATERIAL: **Steel**

PART: **Tidal Turbine Base Plate**



VIEW: SIDE		NOTES: Steel base plate, bolted to concrete channel floor. 4 jack screws provide leveling mechanism. 3 counter-sunk screws from bottom of plate attach vertical turbine support post.
DRAWN BY	NAME DATE	
  		PART: Tidal Turbine Base Plate Steel
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)		U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES



VIEW: FRONT, SIDE

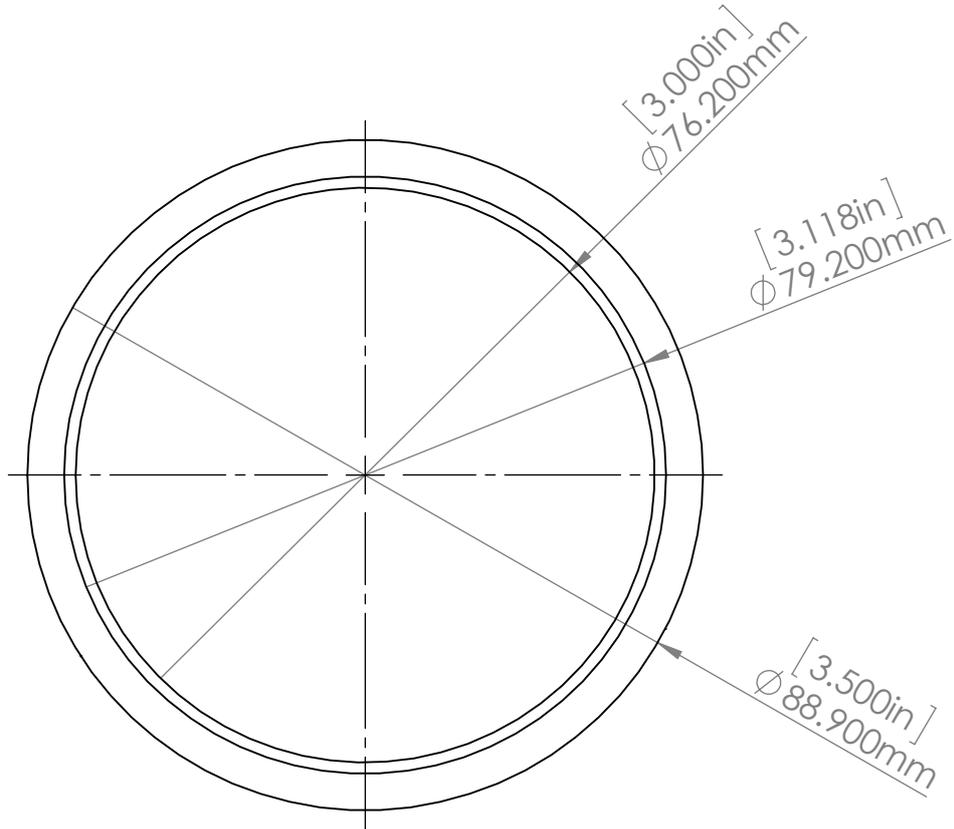
NOTES: Bottom section of the vertical center support post. Bottom of pipe has plug welded into it to provided water tight seal from below. Horizontal post arms welded to exterior and concentric with 2.5" hole bored through. Section ID enlarged to accept insert from Support Tower top section.

NAME	DATE
DRAWN BY	CHECKED BY
  	

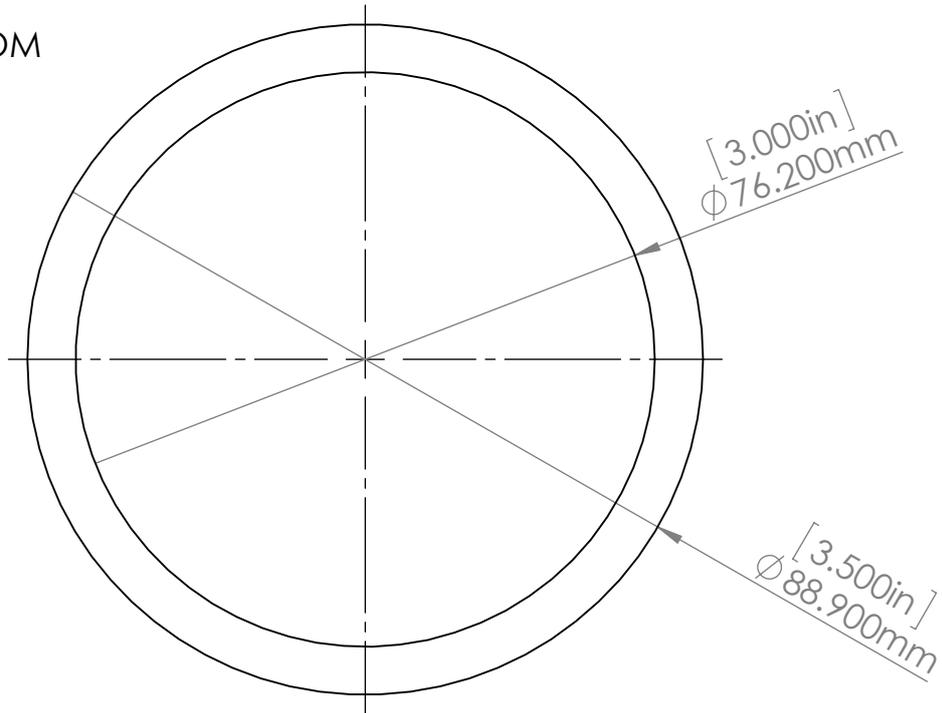
MATERIAL: Aluminum

PART: Support Tower - Bottom Section

TOP



BOTTOM



VIEW: TOP, BOTTOM

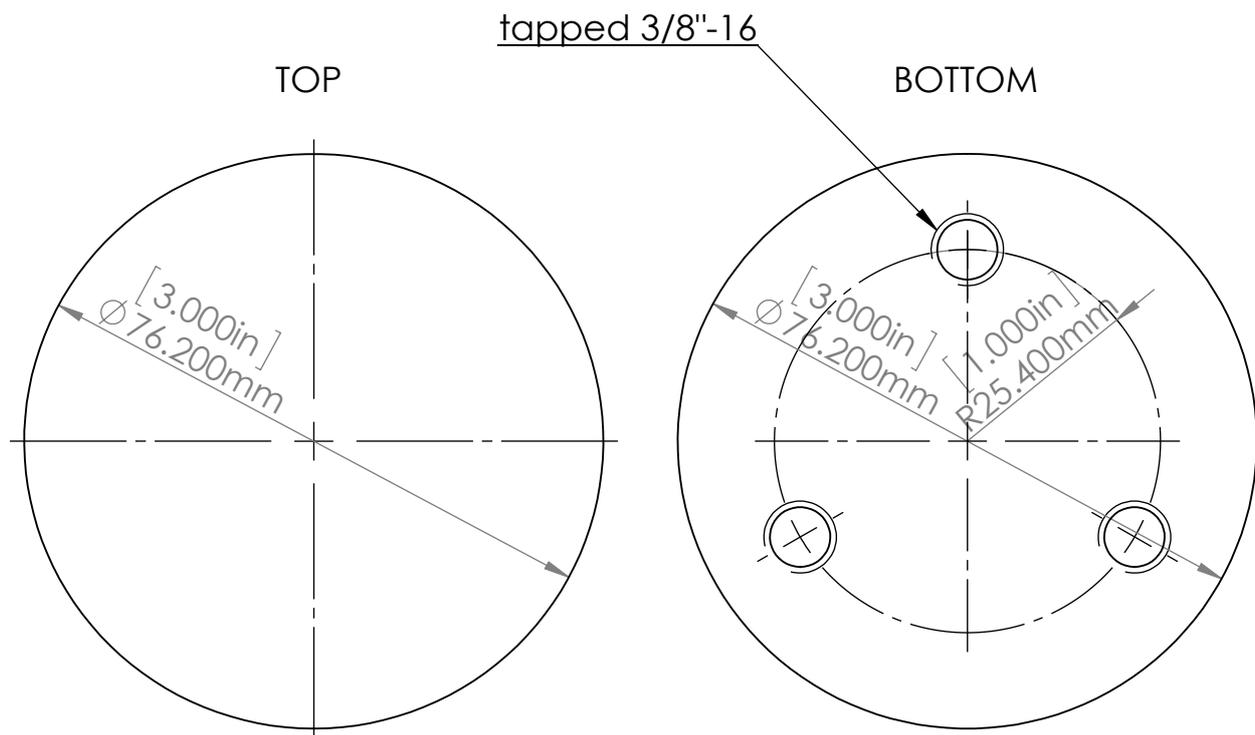
NOTES: Top and Bottom views of the lower section of the tower support post. Bottom section has plug inserted and welded into it. Top portion has inner-diameter bored out slightly to fit top support tower section insert.

DRAWN BY	NAME	DATE

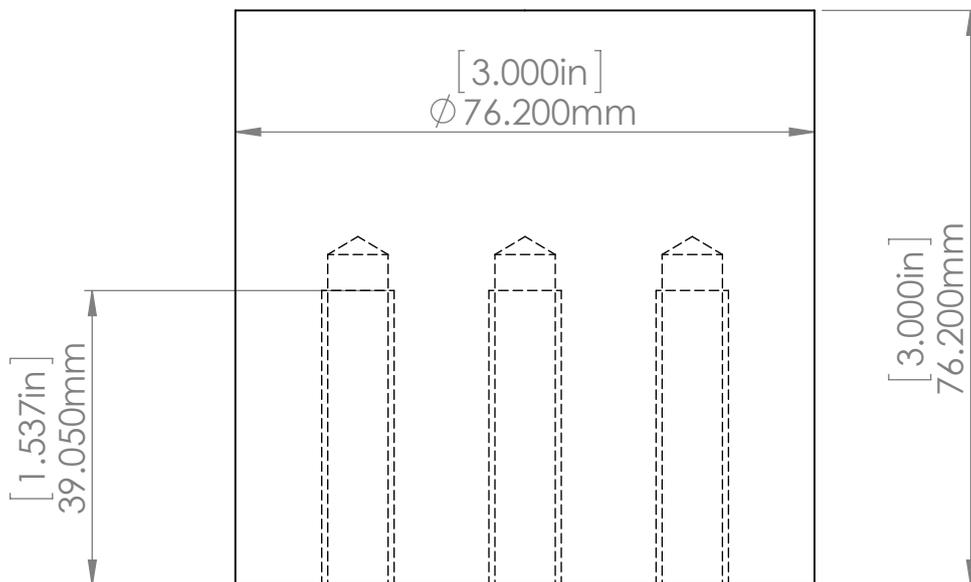
SAFL UNIVERSITY OF MINNESOTA

MATERIAL: Aluminum

PART: Support Tower - Bottom Section



SIDE



Height of plug does not necessarily have to be 3-inches tall.

VIEW:
TOP, BOTTOM, SIDE

NOTES:
Solid plug with 3 threaded holes on bottom to bolt to steel base plate. Recess plug 1/4" into bottom of support tower and weld into bottom to provide a solid, water-tight fit.

DRAWN BY: NAME DATE

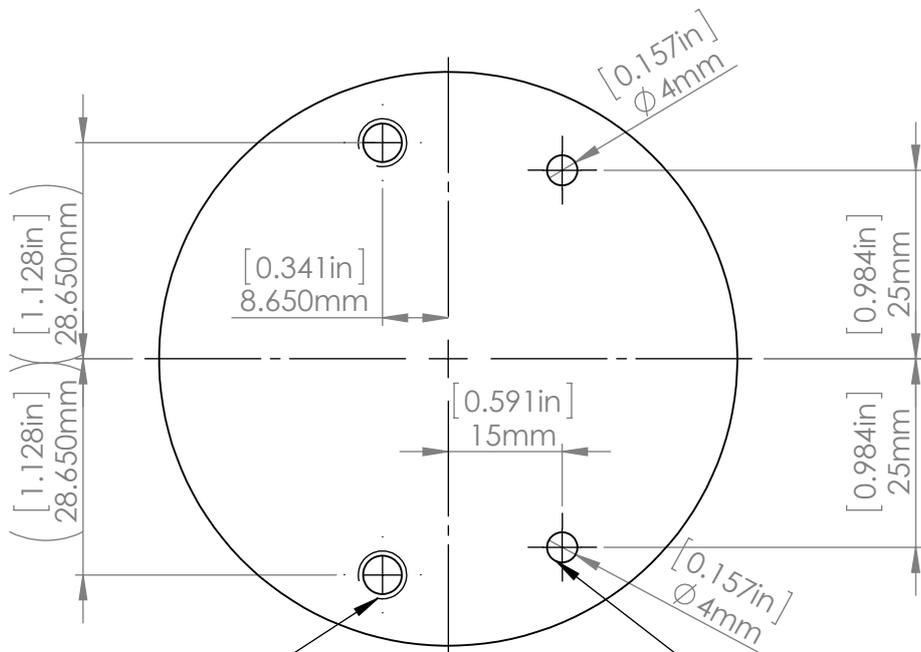
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Aluminum

PART:
Support Post Bottom Plug

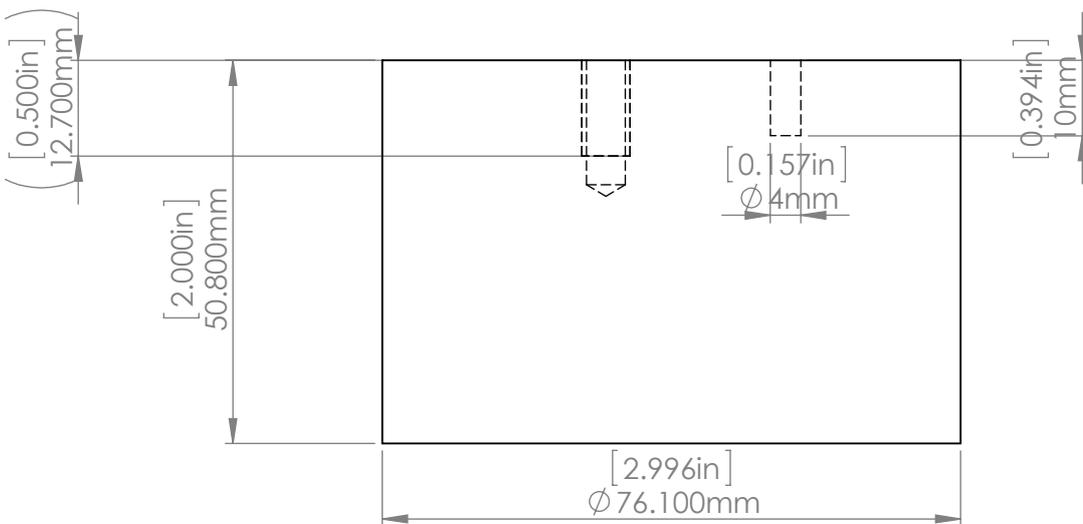


$\frac{1}{4}$ "-20 tapped holes

Locator pins

$[2.996\text{in}]$
 $\Phi 76.100\text{mm}$

OD slightly turned down from 3" to allow for easy slip fit into ID of center support post. May not be needed if it fits just fine originally

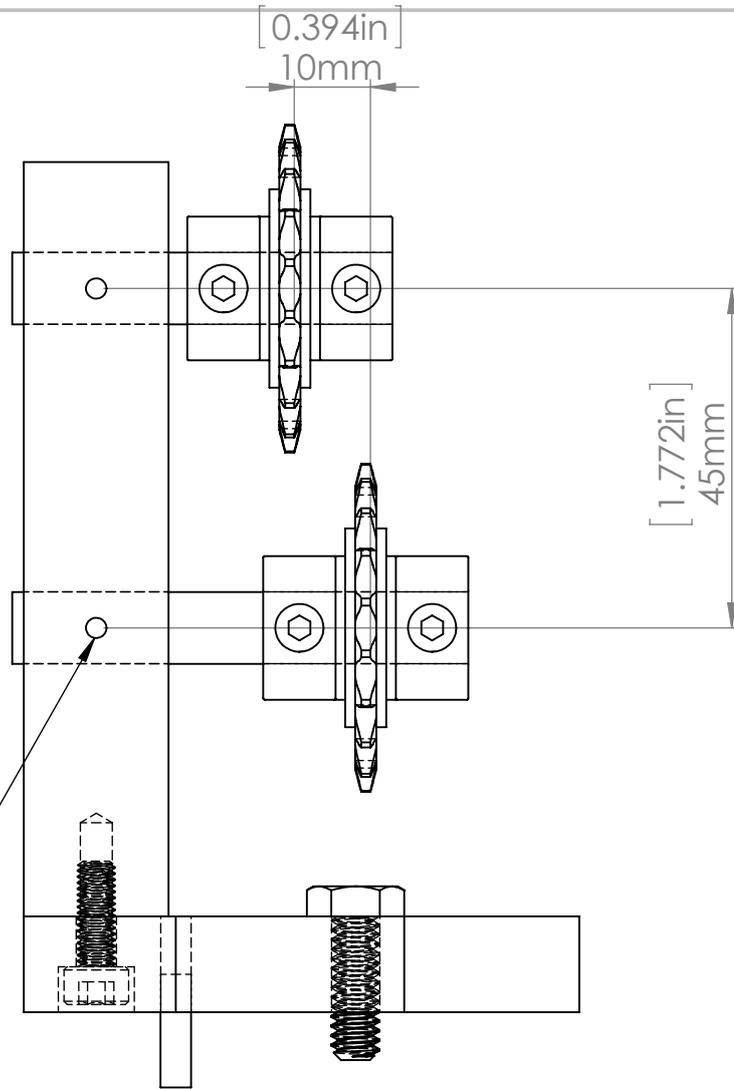


VIEW:
TOP, BOTTOM, SIDE

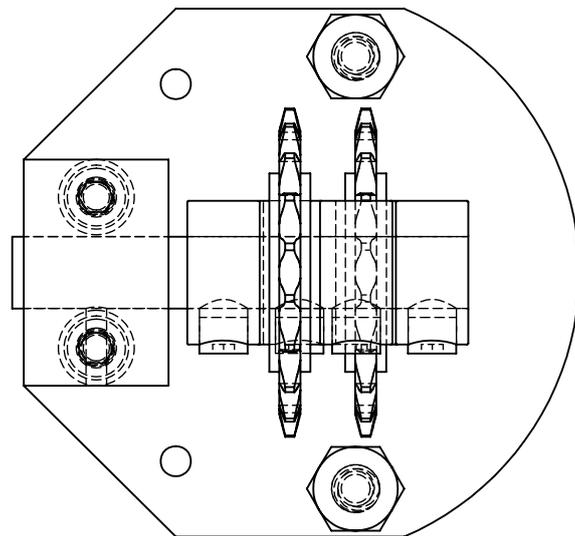
NOTES: Aluminum plug that inserts into center of vertical support post from the top. It is welded into place using the holes for plug welding on the center vertical support post. Top of platform needs to be horizontal to have idler bearing assembly bolted to it.

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 NAME: **UNIVERSITY OF MINNESOTA**
 DATE: **UNIVERSITY OF MINNESOTA**
 MATERIAL: **Aluminum**

PART: **Support Post Insert Platform**



Set screws to hold idler bearing shafts in. Shafts should also be close to press fit to make sure they are secure.



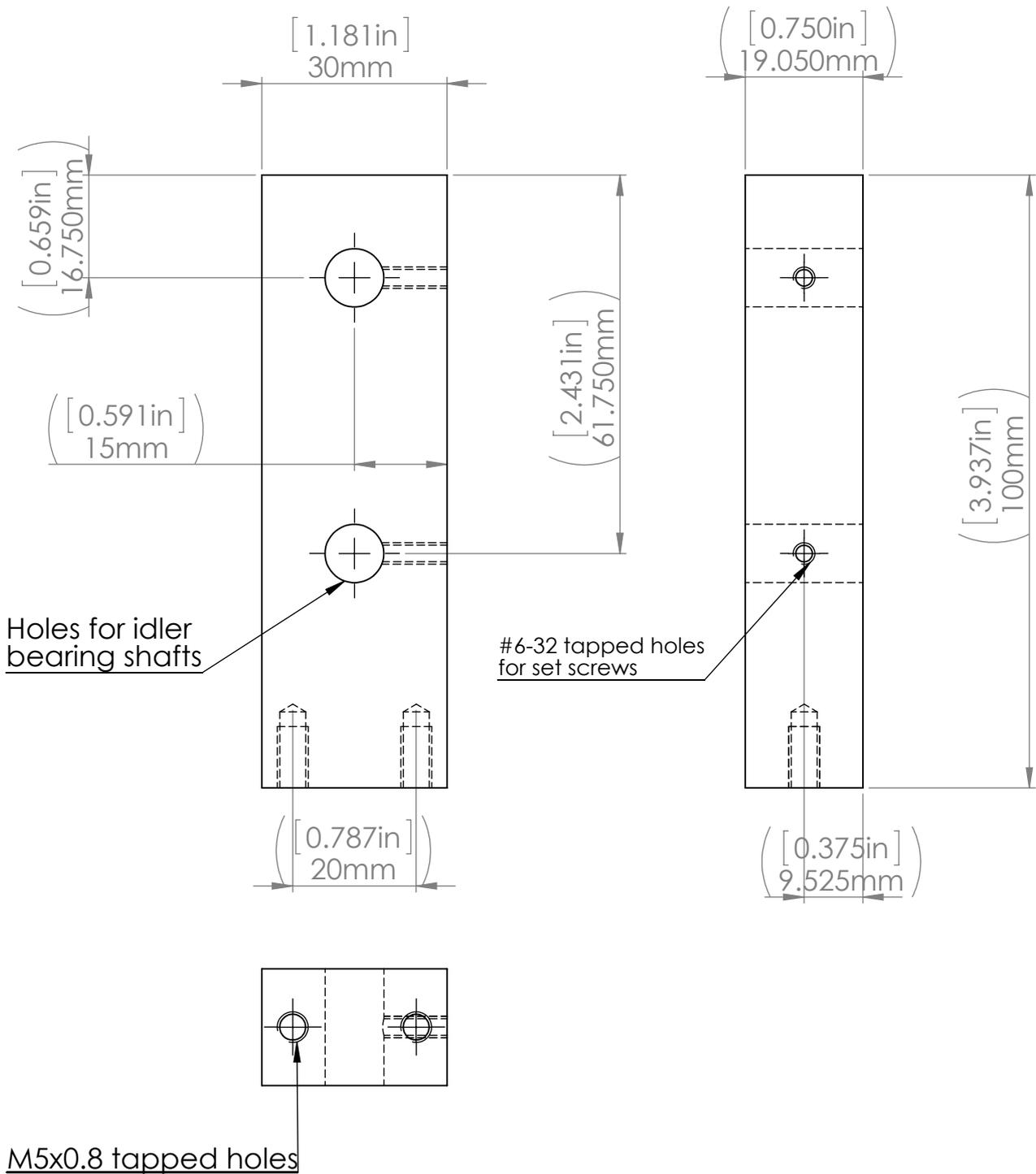
VIEW: SIDE, TOP

NOTES: The idler bearing assembly consists of 2 #25 chain 20-tooth idler bearings offset by 8mm approximately. Platform is bolted to the insert plug that was welded inside of vertical support post.

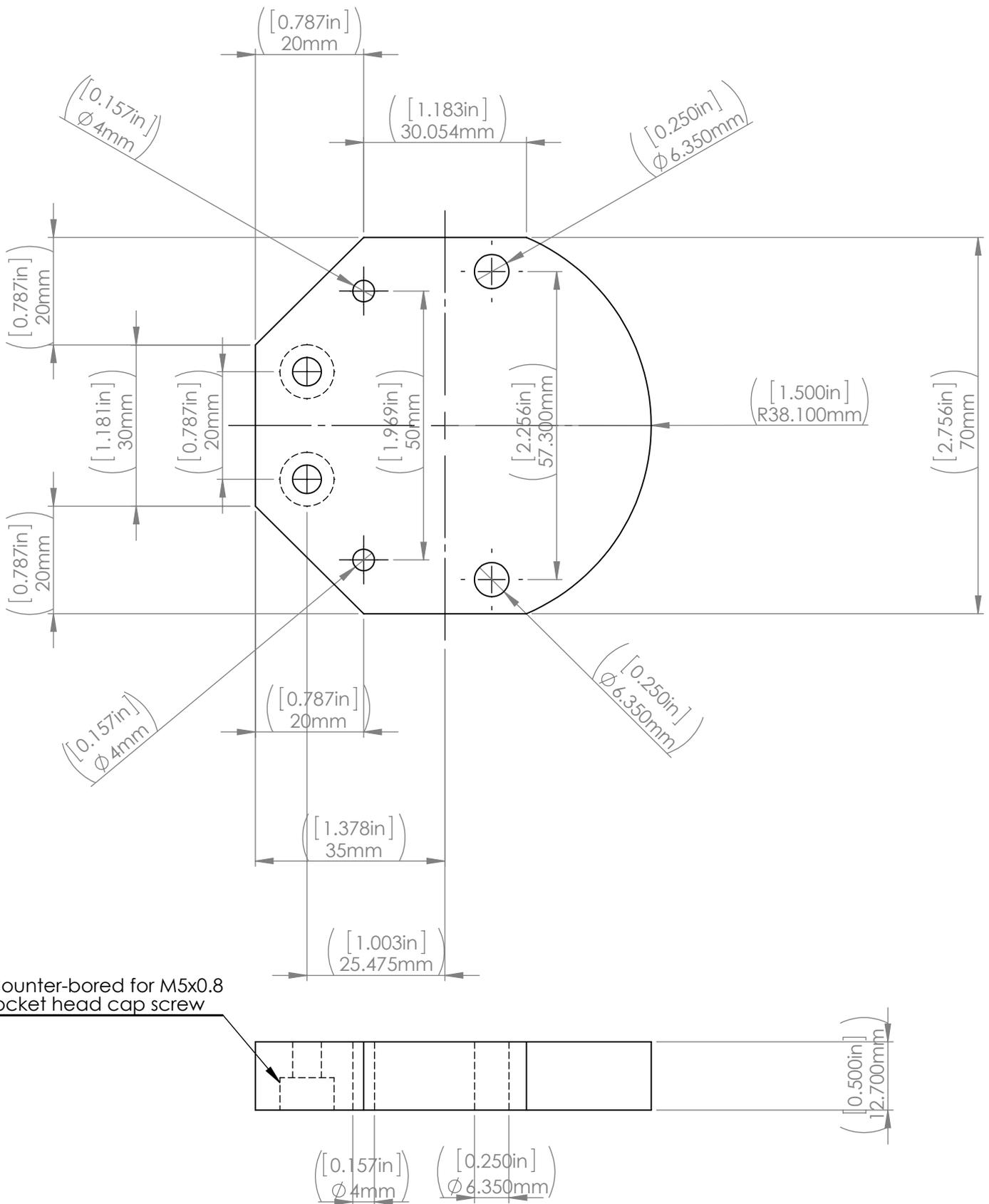
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 Various

PART: Idler bearing assembly



VIEW: FRONT, SIDE, BOTTOM		NOTES: Attaches to idler sprocket holder base by 2 - M5x0.8 socket head cap screws	
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  		SolidWorks Student Edition. For Academic Use Only. Aluminum	
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)		PART:	Idler sprocket holder block
		U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



Counter-bored for M5x0.8 socket head cap screw

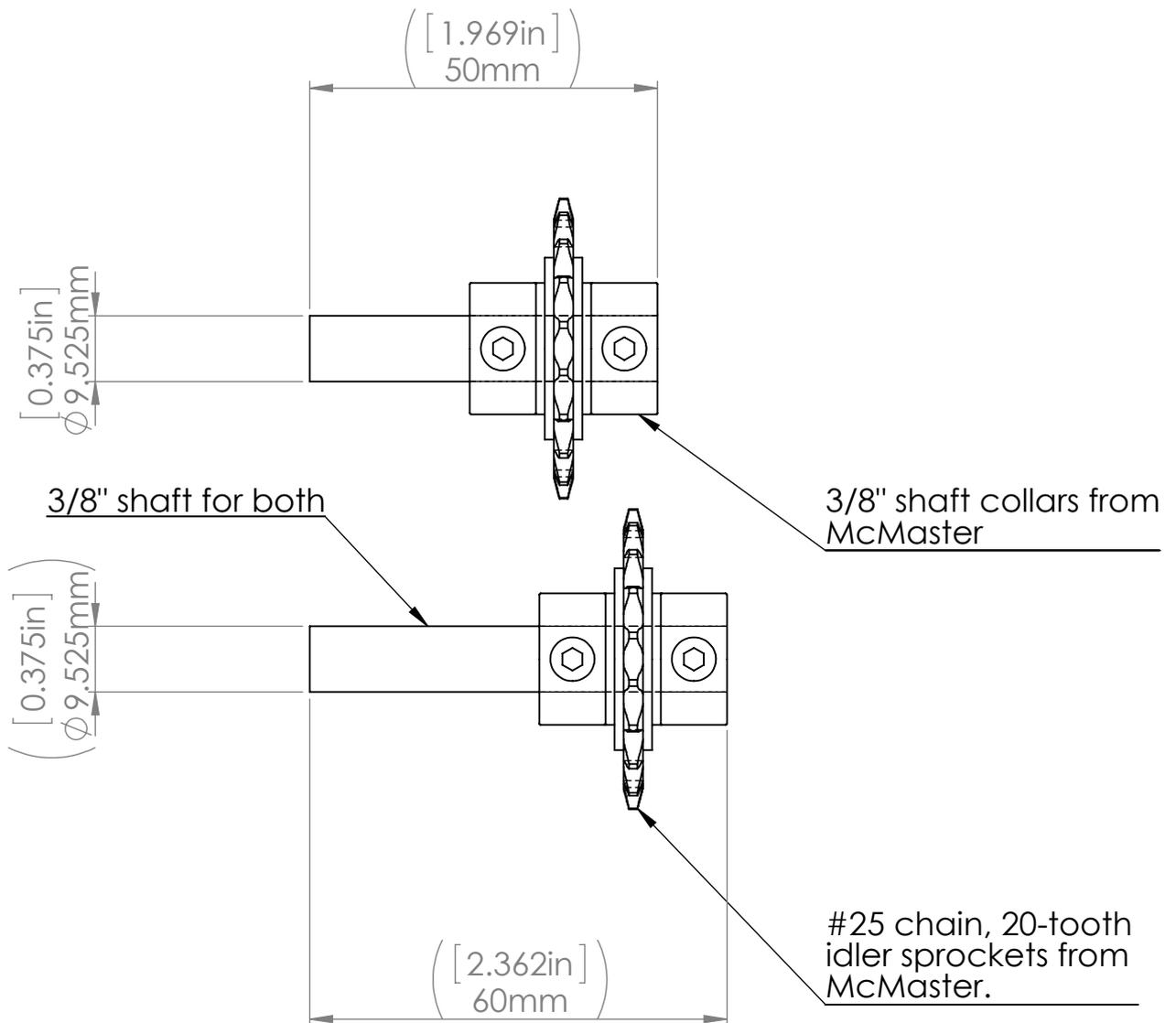
VIEW: TOP, SIDE

NOTES: Bolts to both the idler bearing holder block and the insert plug that is welded into the interior of the center vertical support post.

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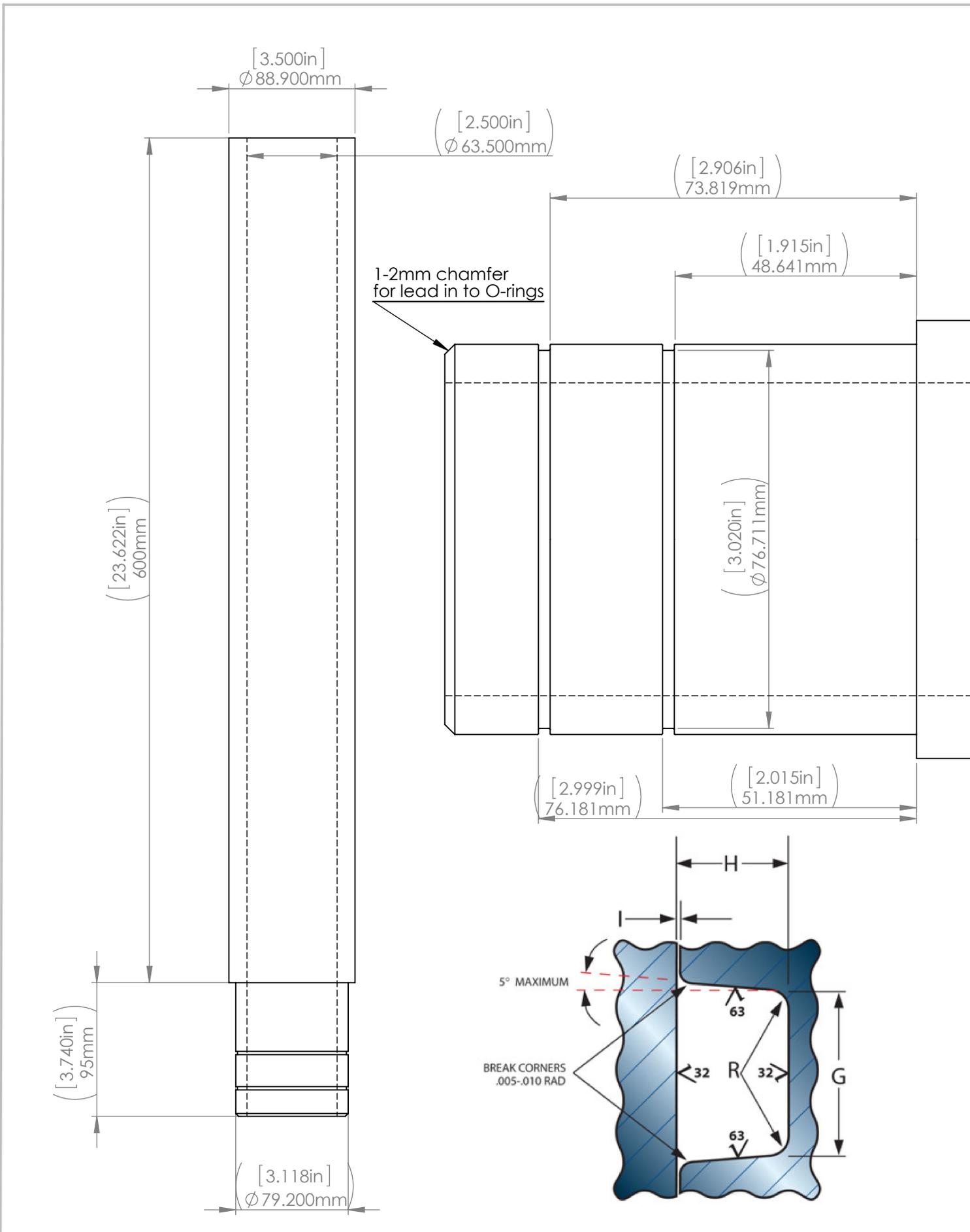
SAFL UNIVERSITY OF MINNESOTA
 MATERIAL: Aluminum

PART: Idler Bearing Bottom Block

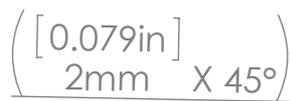
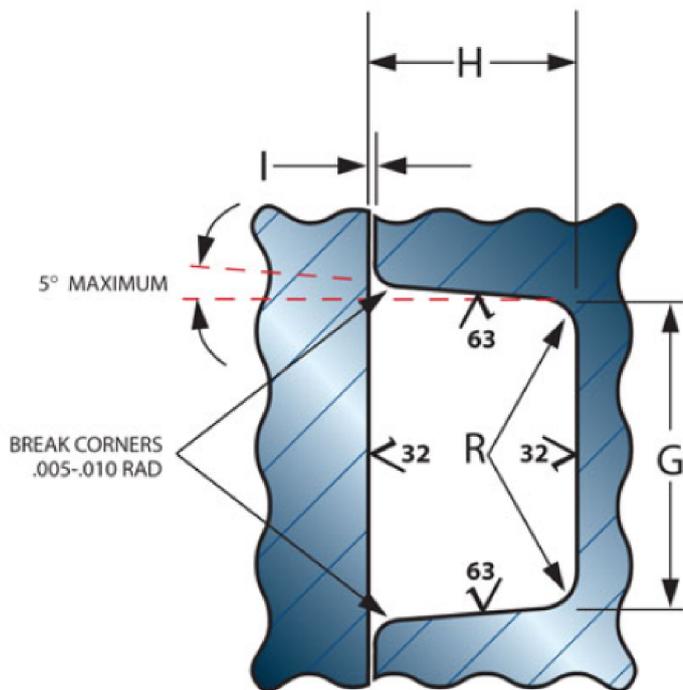
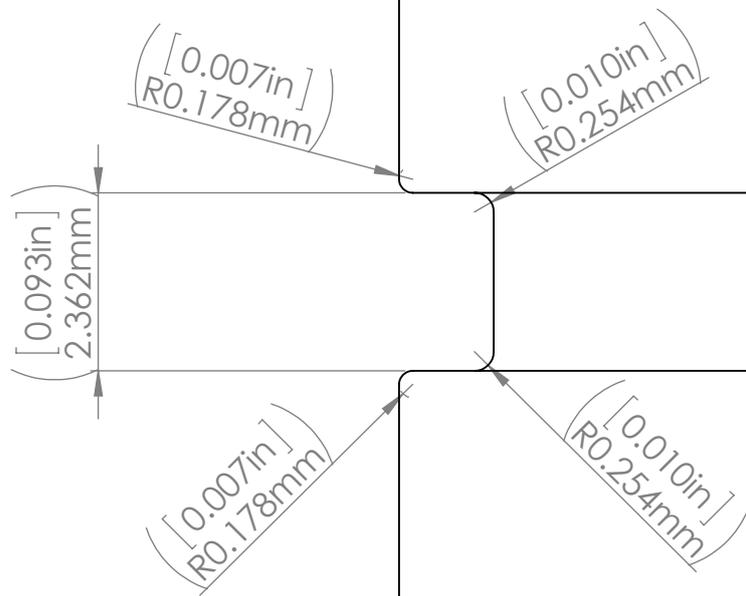


VIEW: SIDE		NOTES: Detailed view of the idler sprockets, shafts, and shaft collars. Most parts can be purchased from McMaster.
DRAWN BY	NAME DATE	
  		Various
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)		PART: Idler Sprockets and shafts U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES

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VIEW: SIDE		NOTES: Inserts into Support Post - Bottom Section. 2 O-ring slots. See other sheet for details on groove dimensions. Dimple set screw locations after initial assembly.
DRAWN BY	DATE	
  		PART: Support Post - Top Section Aluminum
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VIEW: O-RING DETAIL

NOTES: O-ring groove dimension details

DRAWN BY: NAME DATE

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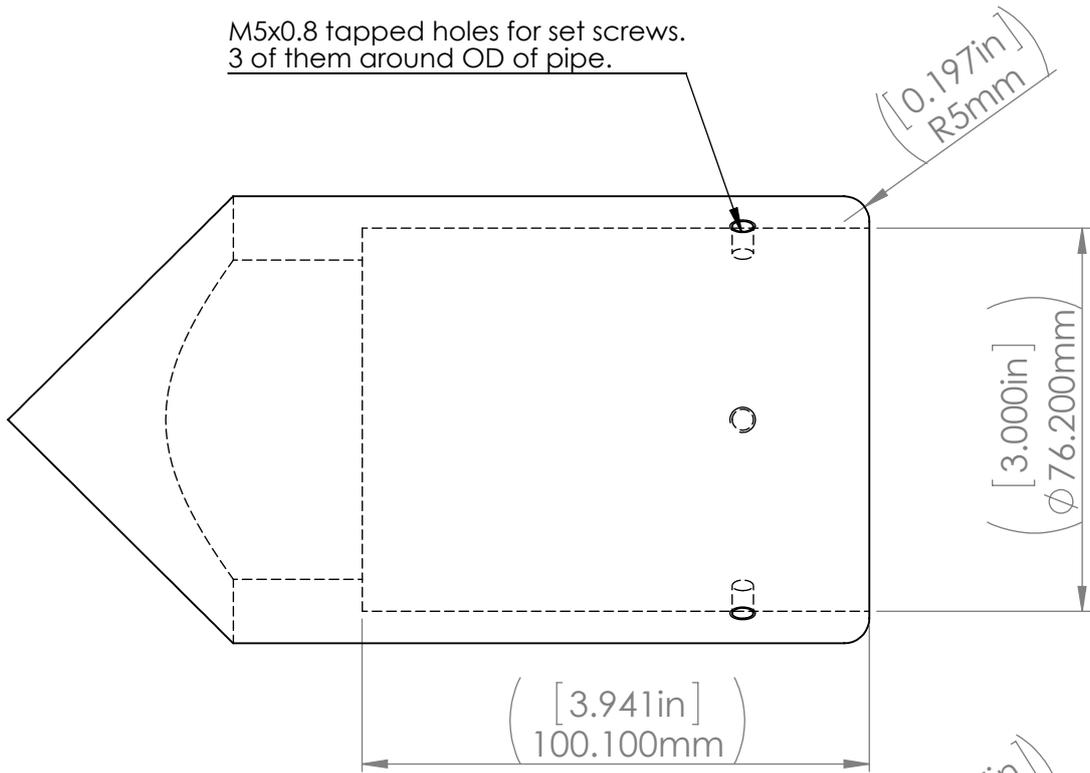


Aluminum

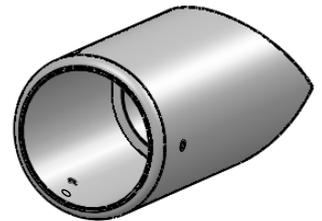
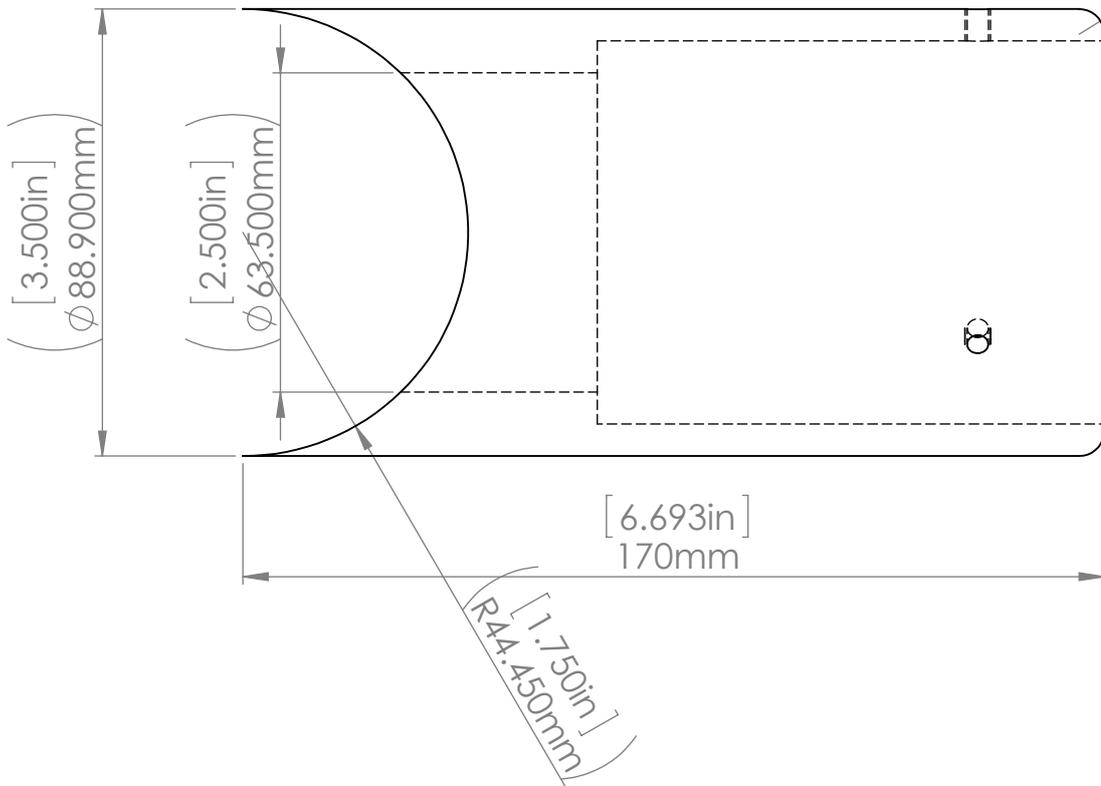
PART: Support Post - Top Section

M5x0.8 tapped holes for set screws.
3 of them around OD of pipe.

FRONT



TOP



VIEW: FRONT, TOP

NOTES:
Two pieces of this are needed. Need to be welded horizontally to the center vertical support post. End away from center post has ID bore enlarged to accept insertion of Nacelle horizontal arm with 2 O-rings. Three set screw secured Nacelle horizontal arm in place.

DRAWN BY: NAME DATE

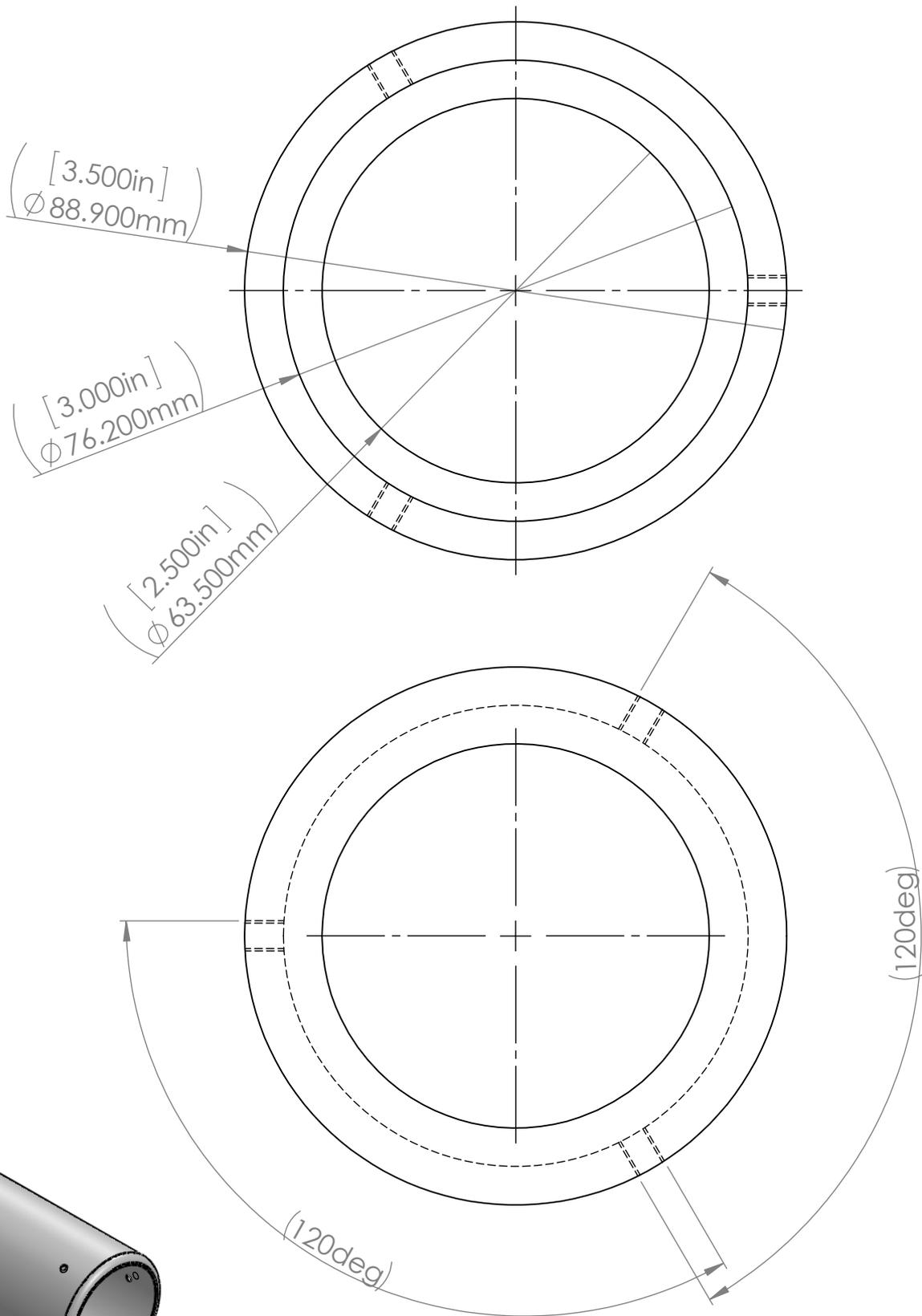


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Aluminum

PART: Horizontal Arm Section



VIEW: END VIEW

NOTES: 2 pieces of this part needed. Will be welded horizontally on to the center vertical support post.

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Aluminum

PART: Horizontal Arm Section