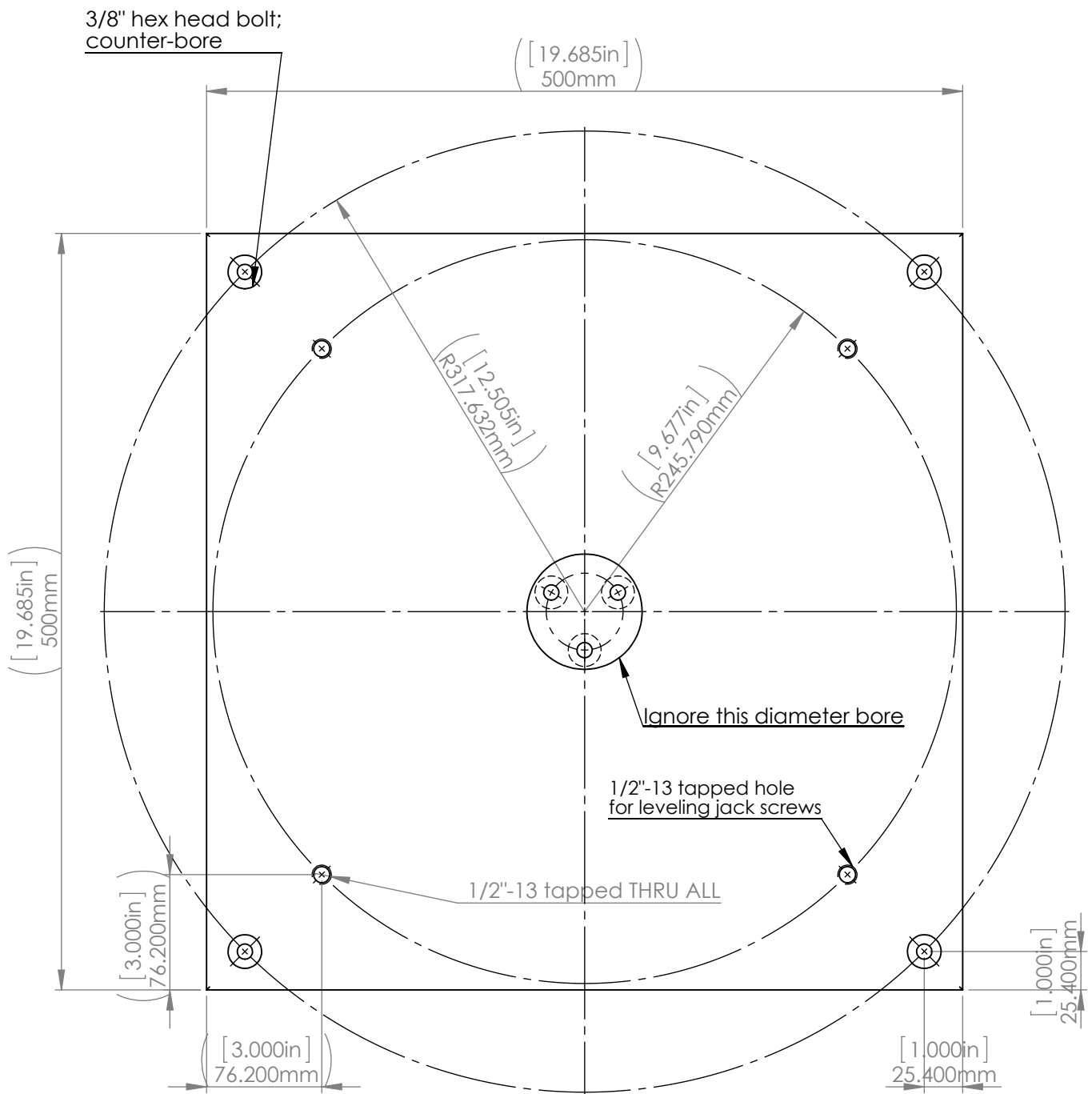



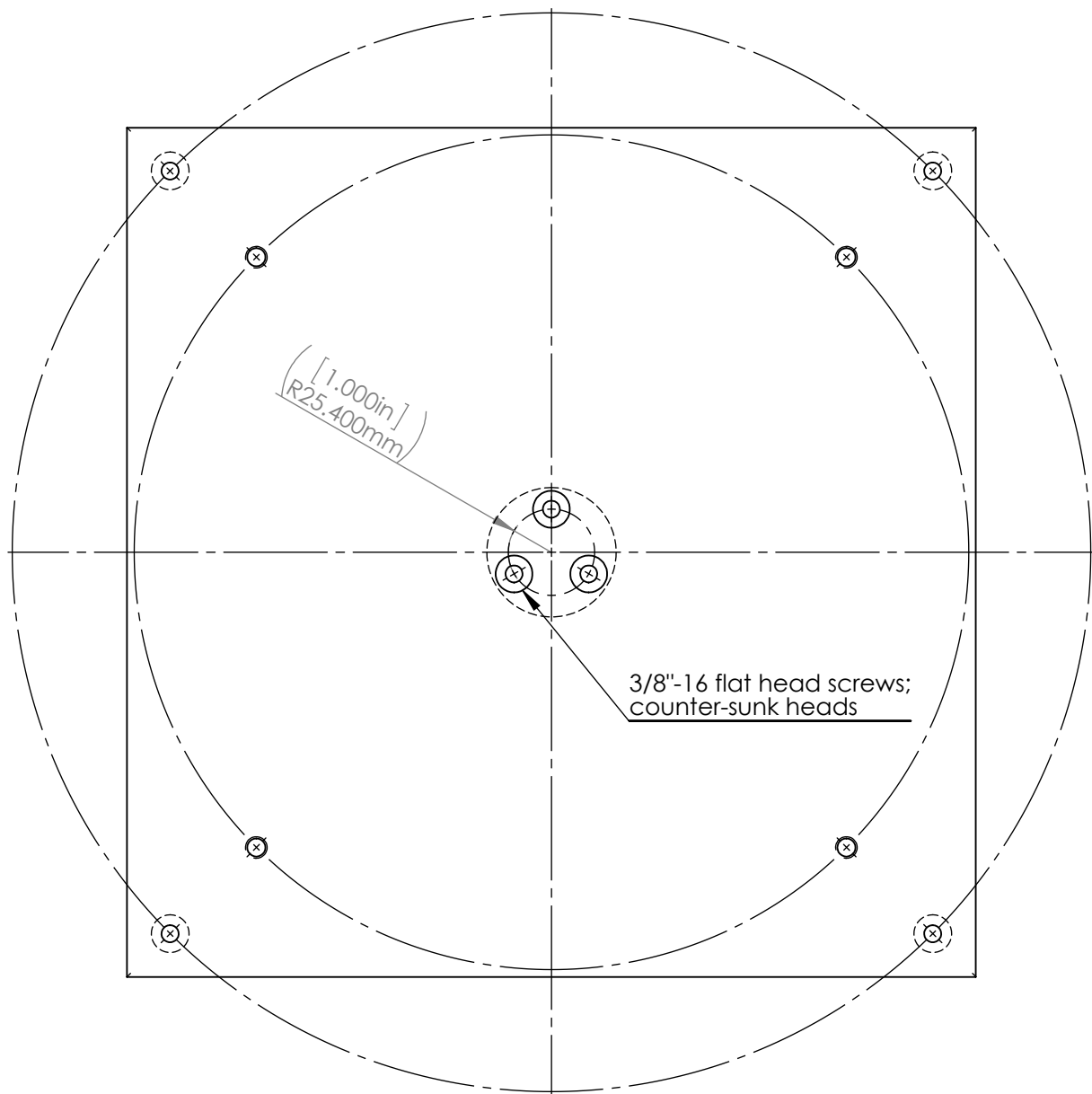





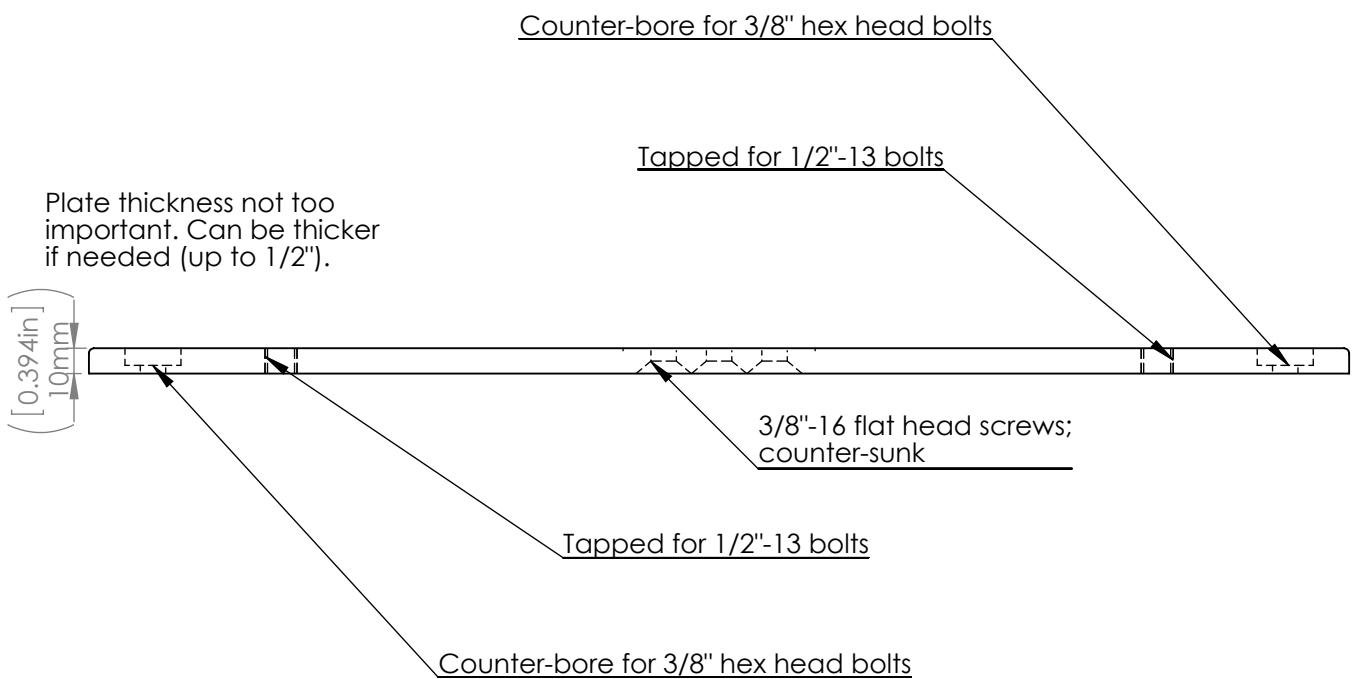
VIEW: FRONT			NOTES:	
DRAWN BY	NAME	DATE		
SolidWorks Student Edition. For Academic Use Only.				
SAFL	UNIVERSITY OF MINNESOTA	UNIVERSITY OF MINNESOTA	PART: Tidal Turbine Support Tower Assembly	
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE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



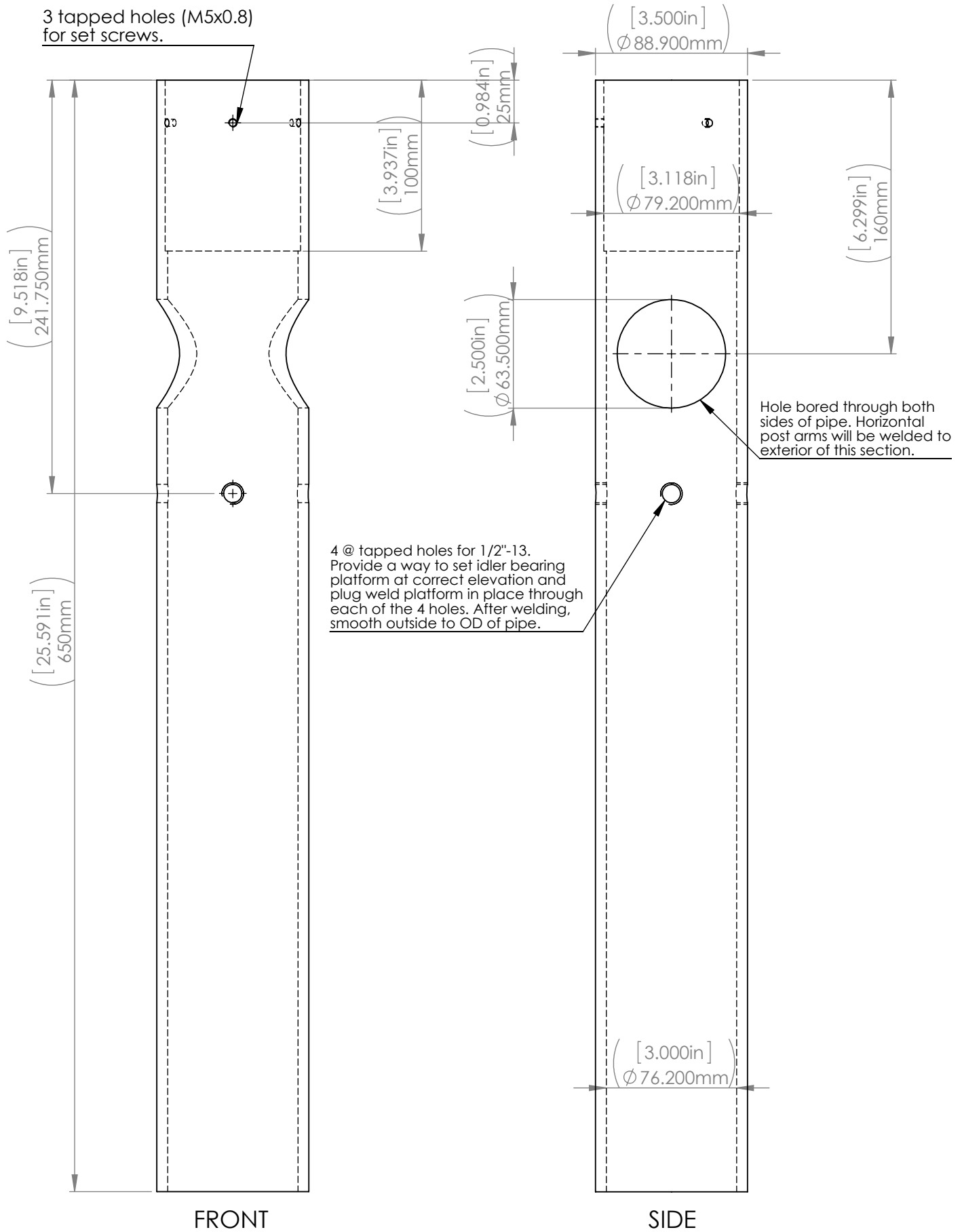
VIEW: TOP			NOTES: Steel base plate, bolted to concrete channel floor. 4 jack screws provide leveling mechanism. 3 counter-sunk screws from bottom of plate attach vertical turbine support post.
DRAWN BY	NAME	DATE	
SolidWorks Student Edition. For Academic Use Only.			PART: Tidal Turbine Base Plate
		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

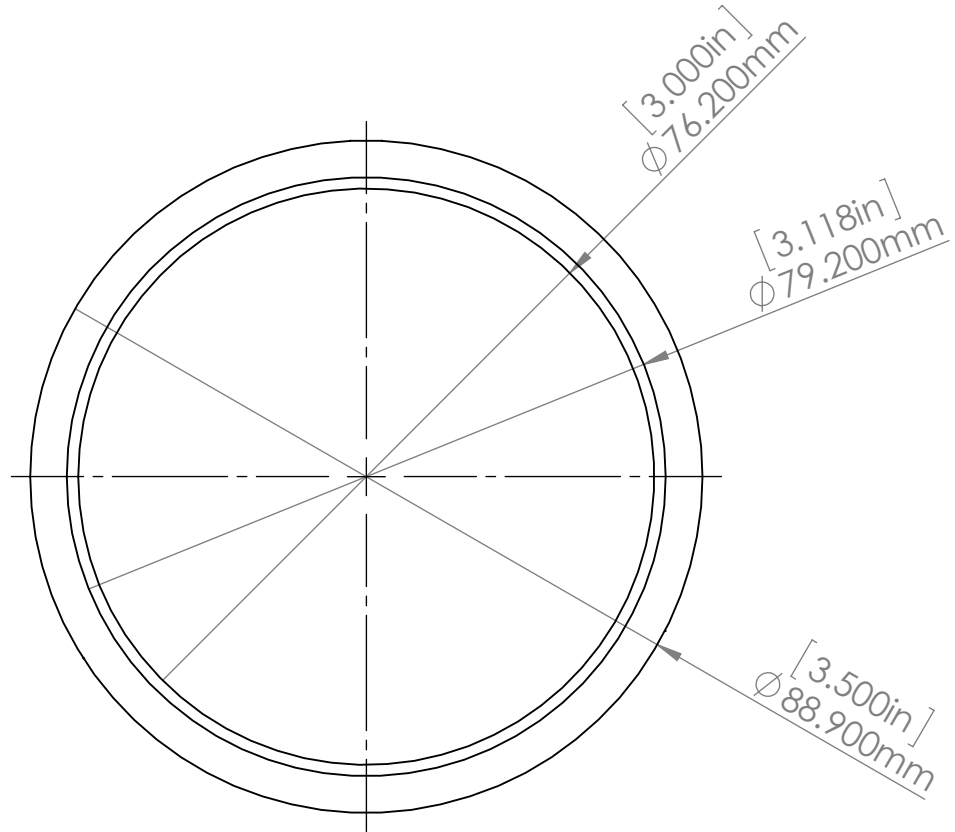


VIEW: SIDE			NOTES: Steel base plate, bolted to concrete channel floor. 4 jack screws provide leveling mechanism. 3 counter-sunk screws from bottom of plate attach vertical turbine support post.
DRAWN BY	NAME	DATE	
SAFL	UNIVERSITY OF MINNESOTA	UNIVERSITY OF MINNESOTA	
MATERIAL: Steel			PART: Tidal Turbine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

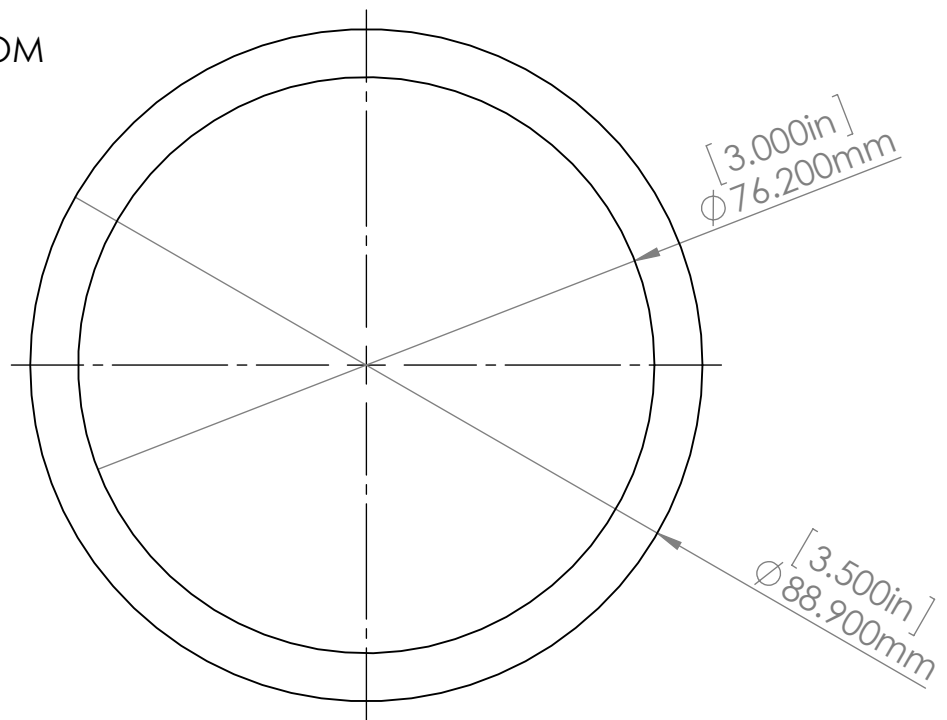





VIEW: FRONT, SIDE			NOTES: Bottom section of the vertical center support post. Bottom of pipe has plug welded into it to provided water tight seal from below. Horizontal post arms welded to exterior and concentric with 2.5" hole bored through. Section ID enlarged to accept insert from Support Tower top section.
NAME	DATE		
DRAWN BY			
SolidWorks Student Edition.			
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			MATERIAL: Aluminum
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			PART: Support Tower - Bottom Section
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES

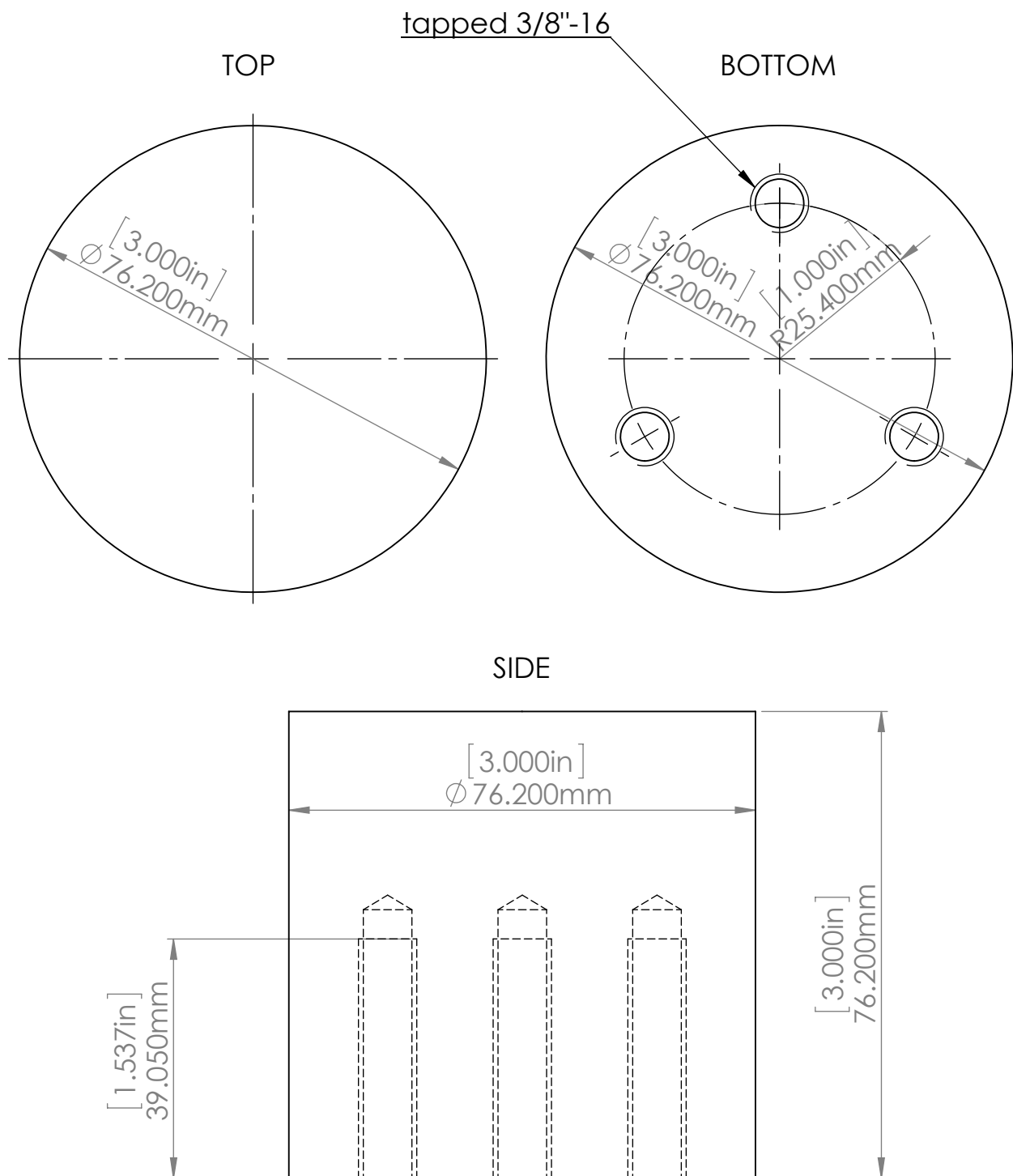
TOP






BOTTOM

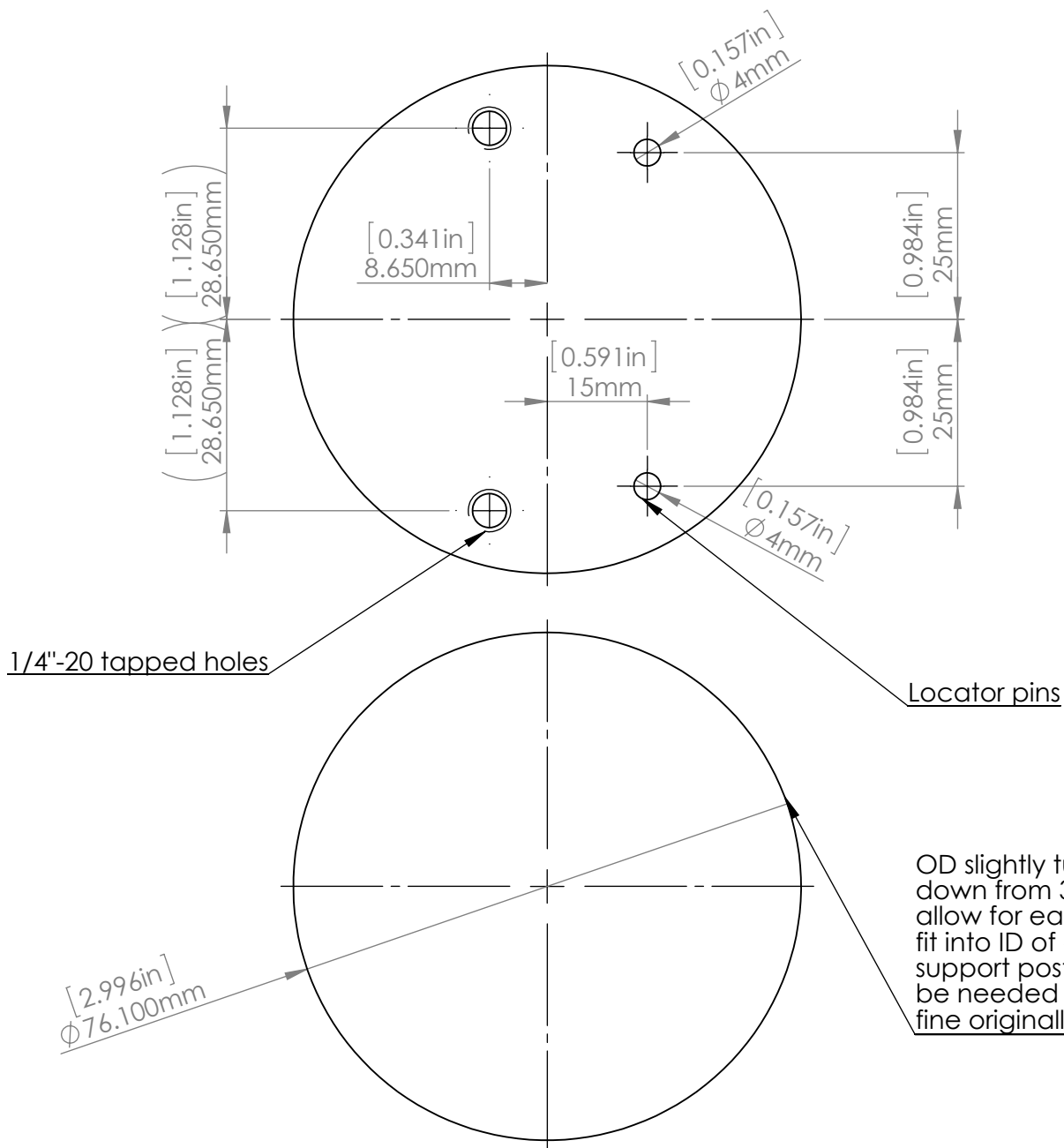


VIEW: TOP, BOTTOM			NOTES: Top and Bottom views of the lower section of the tower support post. Bottom section has plug inserted and welded into it. Top portion has inner-diameter bored out slightly to fit top support tower section insert.	
DRAWN BY	NAME	DATE		
  			PART: Support Tower - Bottom Section	
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



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		
  			PART: Support Post Bottom Plug	
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



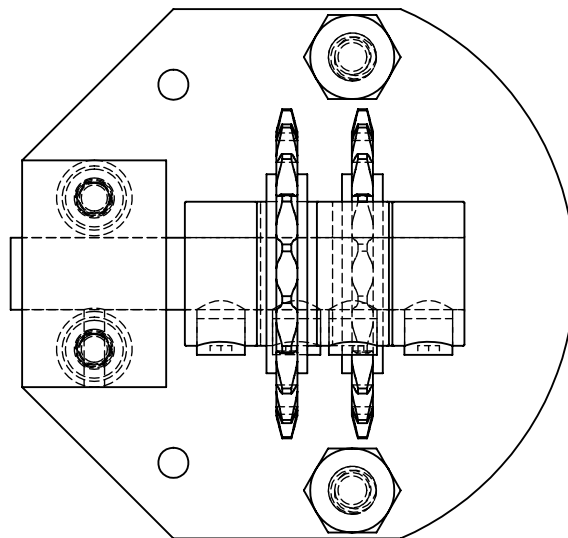
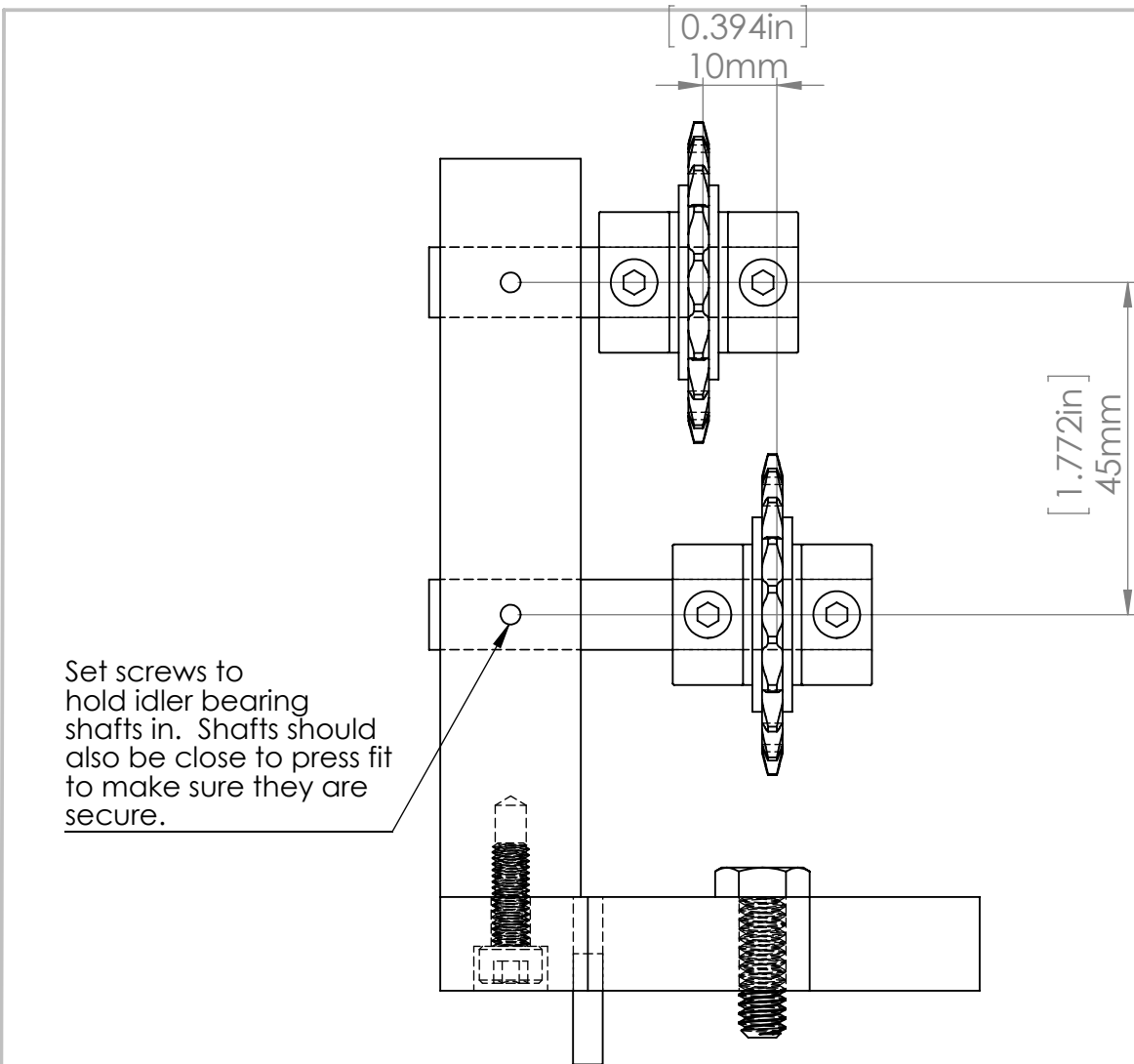
VIEW:
TOP, BOTTOM, SIDE




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.

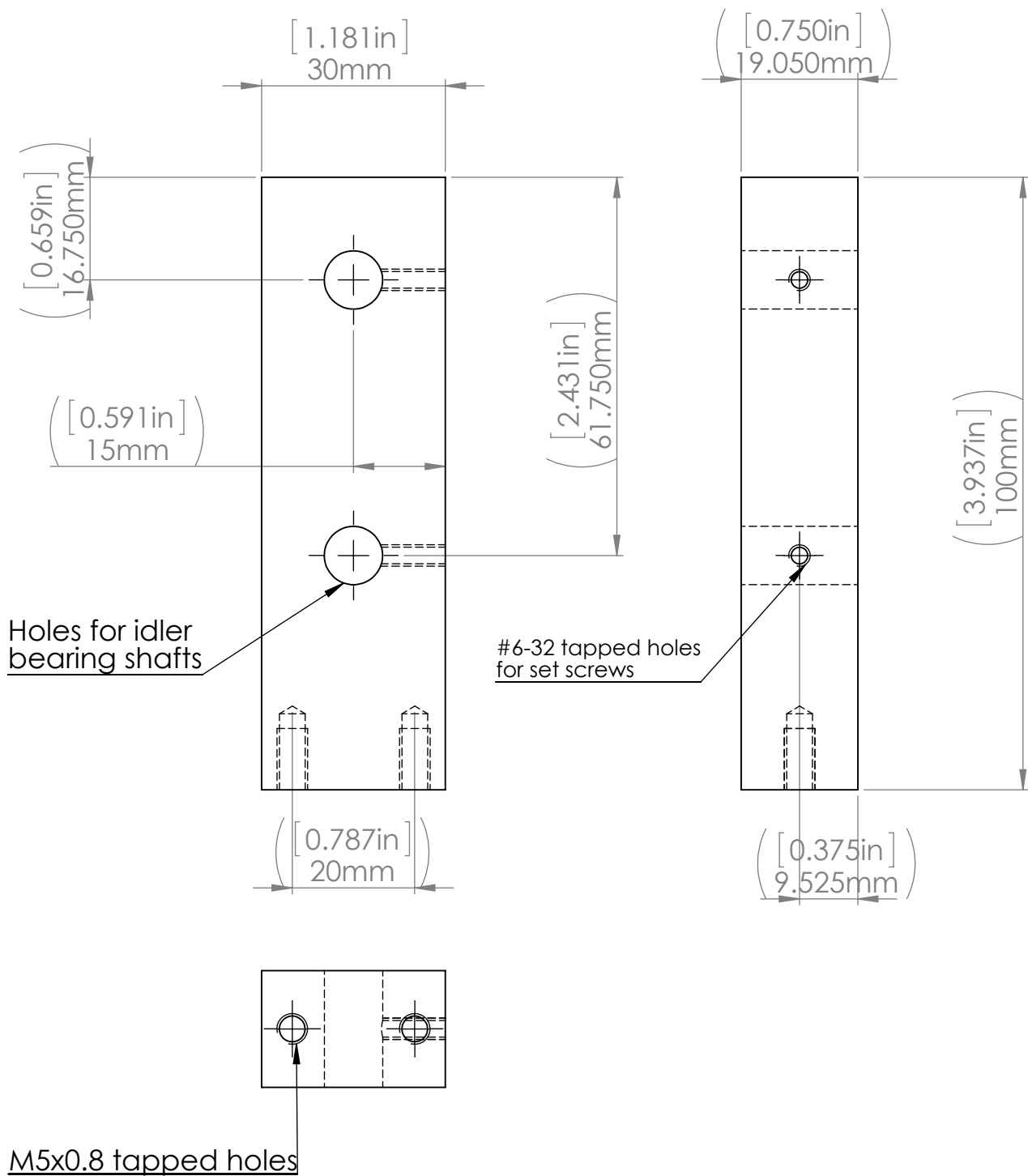
DRAWN BY	NAME	DATE
  		

MATERIAL:
Aluminum

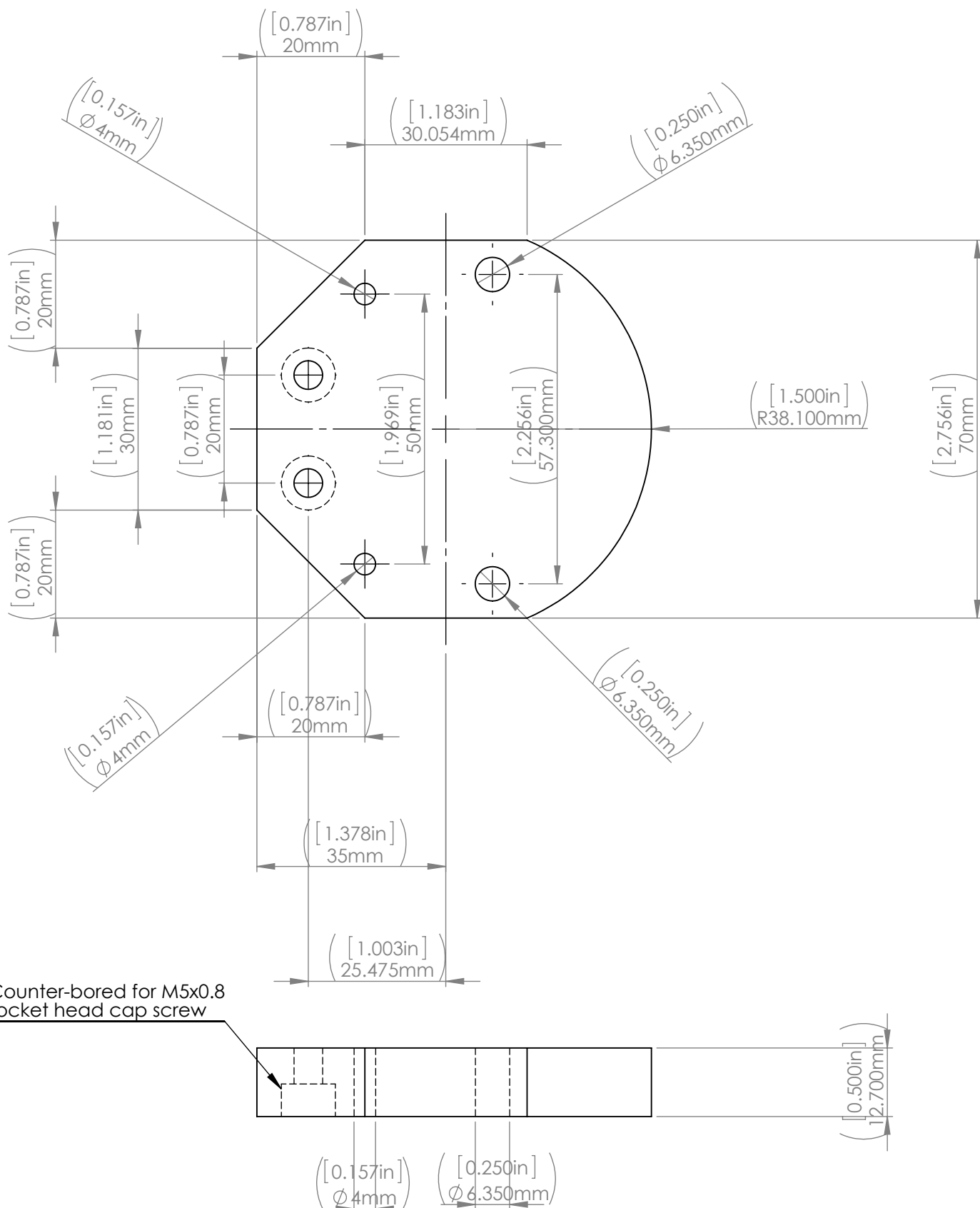
PART:
Support Post Insert Platform



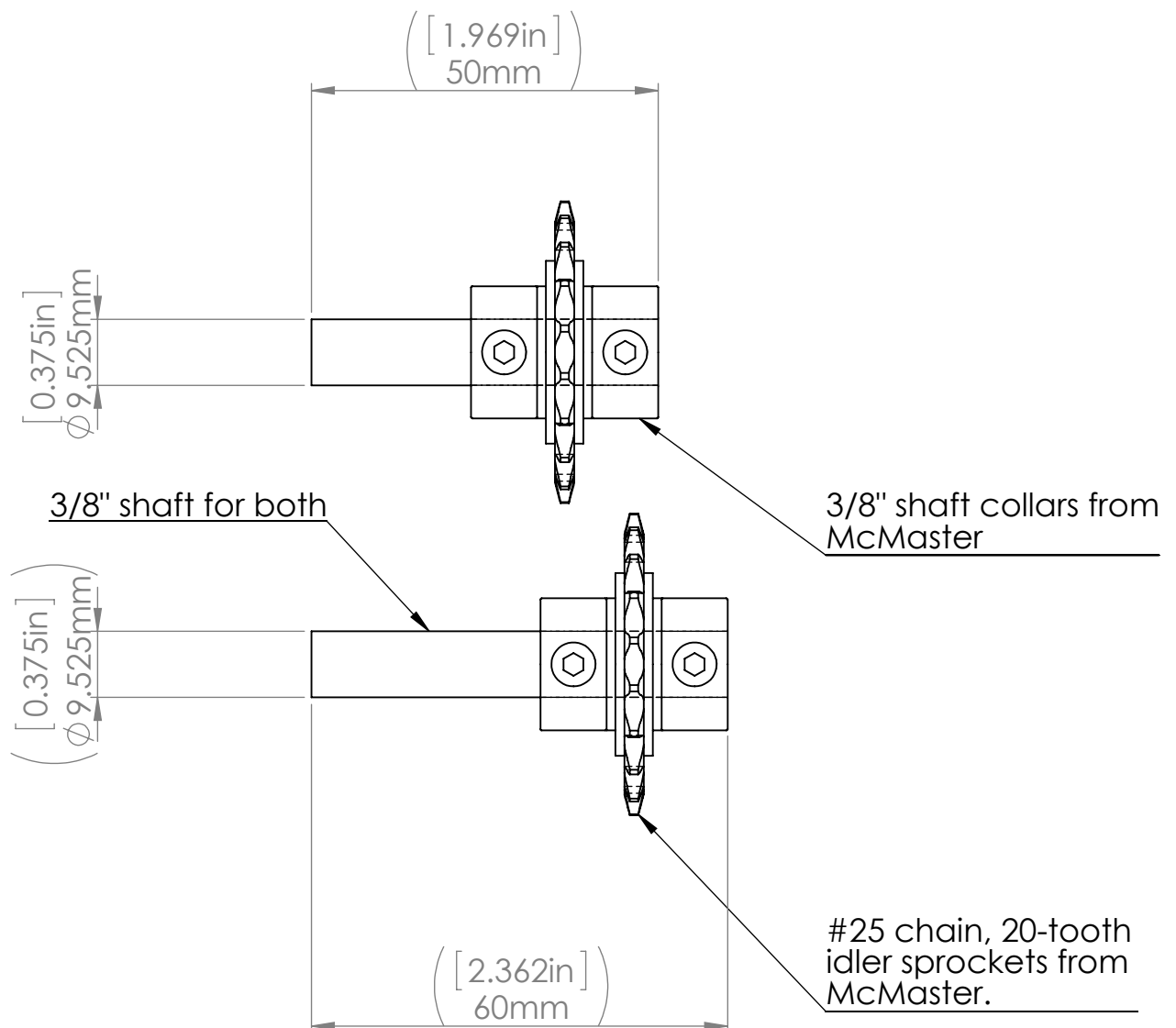
VIEW: SIDE, TOP			NOTES: The idler bearing assembly consists of 2 #25 chain 20-tooth idler bearings offset by 8mm approximately. Platform is bolted to the insert plug that was welded inside of vertical support post.	
DRAWN BY	NAME	DATE		
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  			PART:	Idler bearing assembly
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



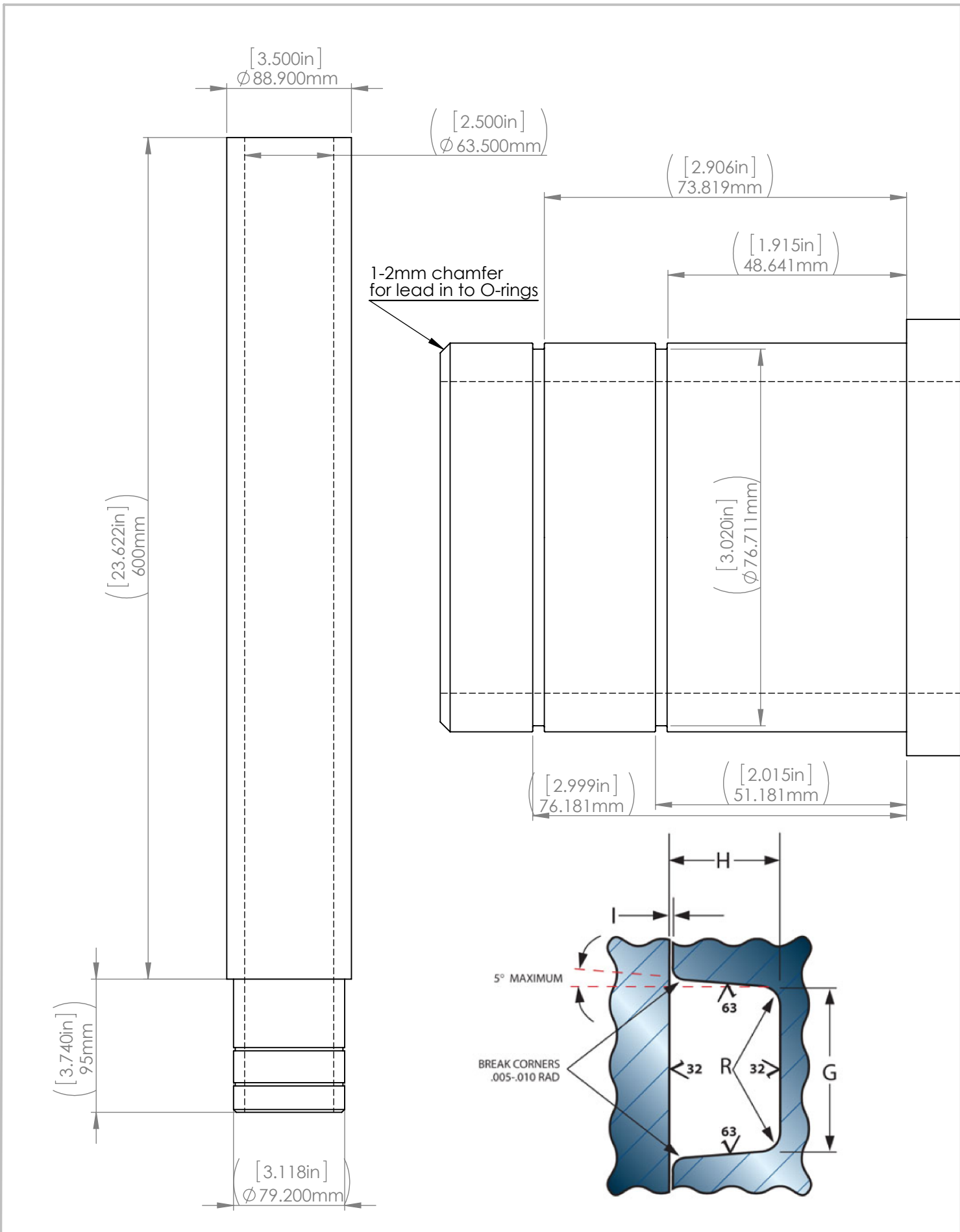
VIEW: FRONT, SIDE, BOTTOM			NOTES: Attaches to idler sprocket holder base by 2 - M5x0.8 socket head cap screws	
DRAWN BY	NAME	DATE		
SolidWorks Student Edition.				
For Academic Use Only.				
Aluminum			PART:	Idler sprocket holder block
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)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



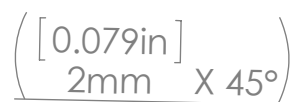
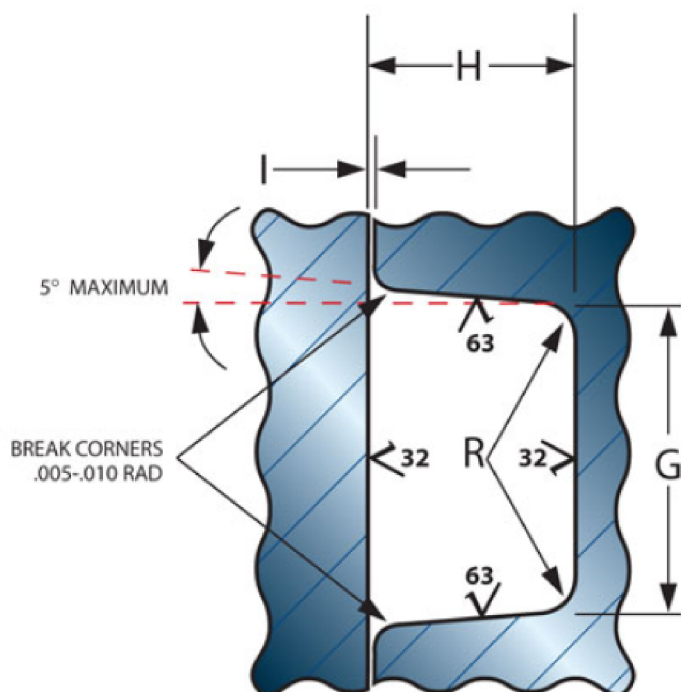
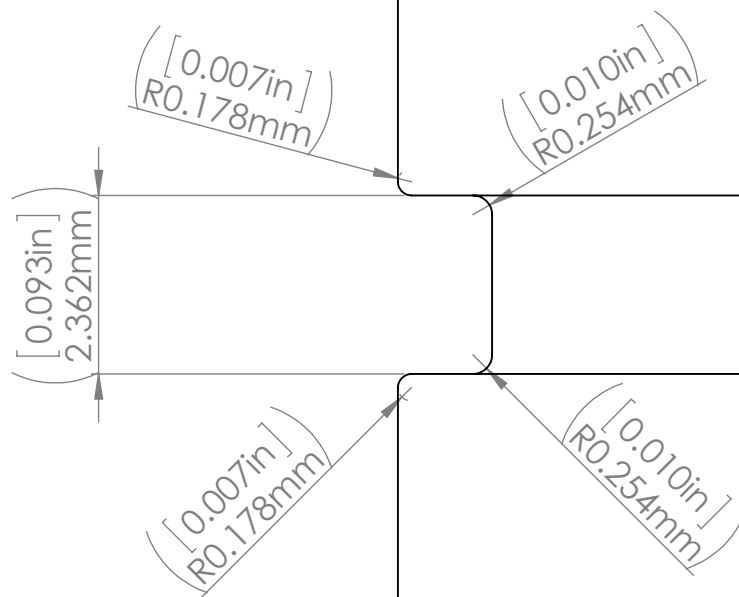
VIEW: TOP, SIDE		NOTES: Bolts to both the idler bearing holder block and the insert plug that is welded into the interior of the center vertical support post.	
DRAWN BY	NAME	DATE	
SolidWorks Student Edition.		PART: Idler Bearing Bottom Block	
For Academic Use Only.		Aluminum	
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VIEW: SIDE			NOTES: Detailed view of the idler sprockets, shafts, and shaft collars. Most parts can be purchased from McMaster.	
DRAWN BY	NAME	DATE		
SolidWorks Student Edition. For Academic Use Only.				
SAFL	UNIVERSITY OF MINNESOTA	UNIVERSITY OF MINNESOTA	MATERIAL: Various	PART: Idler Sprockets and shafts
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



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.	
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Aluminum			PART:	Support Post - Top Section
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



VIEW: O-RING DETAIL

NOTES: O-ring groove dimension details

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 UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL) Aluminum

PART: Support Post - Top Section

FRONT

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

([0.197in]
R5mm)

([3.000in]
Ø 76.200mm)

([3.941in]
100.100mm)

([0.197in]
R5mm)

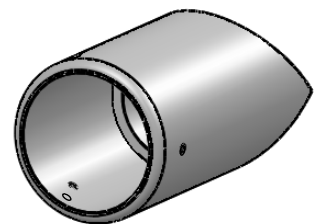
TOP

([3.500in]
Ø 88.900mm)

([2.500in]
Ø 63.500mm)

([6.693in]
170mm)

([1.750in]
R44.450mm)



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

DRAWN BY

NAME

DATE



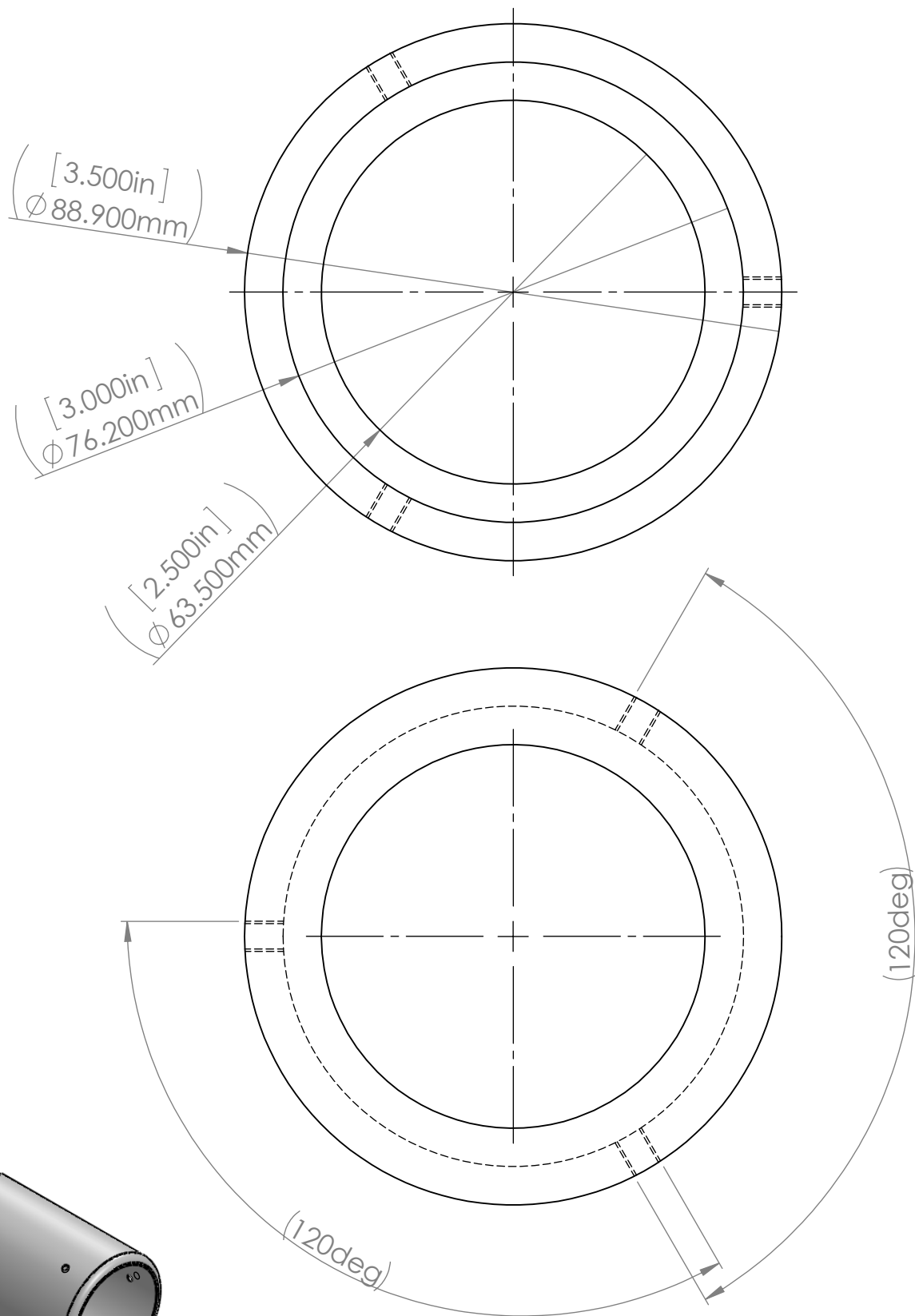
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Aluminum

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.

DRAWN BY

NAME

DATE

SolidWorks Student Edition.



Aluminum

PART:

Horizontal Arm Section