

VIEW:

SIDE

NOTES:

DRAWN BY

NAME

DATE



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UNIVERSITY OF MINNESOTA



MATERIAL

Various

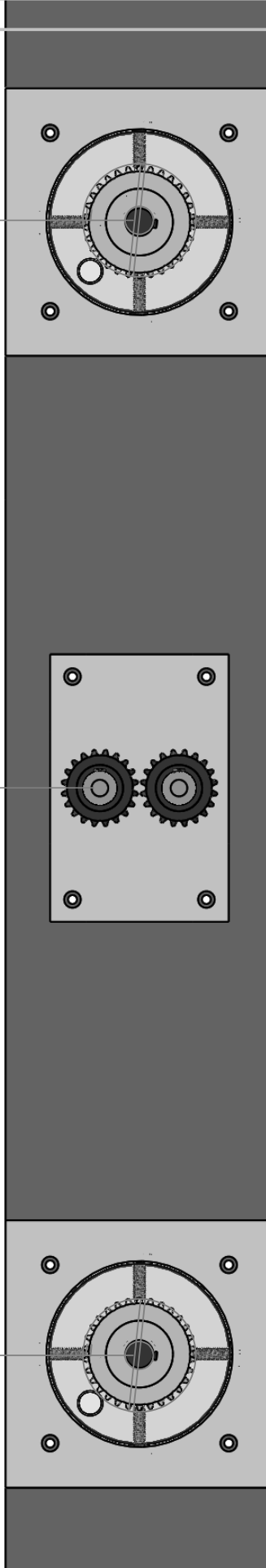
PART:

River Turbine Assembly

[25.394in]
645mm

([12.697in]
322.500mm)

([12.697in]
322.500mm)



Top view of the River Turbine drive assembly showing idler bearing setup and spacing of the main sprockets and shaft.

VIEW:

TOP

NOTES:

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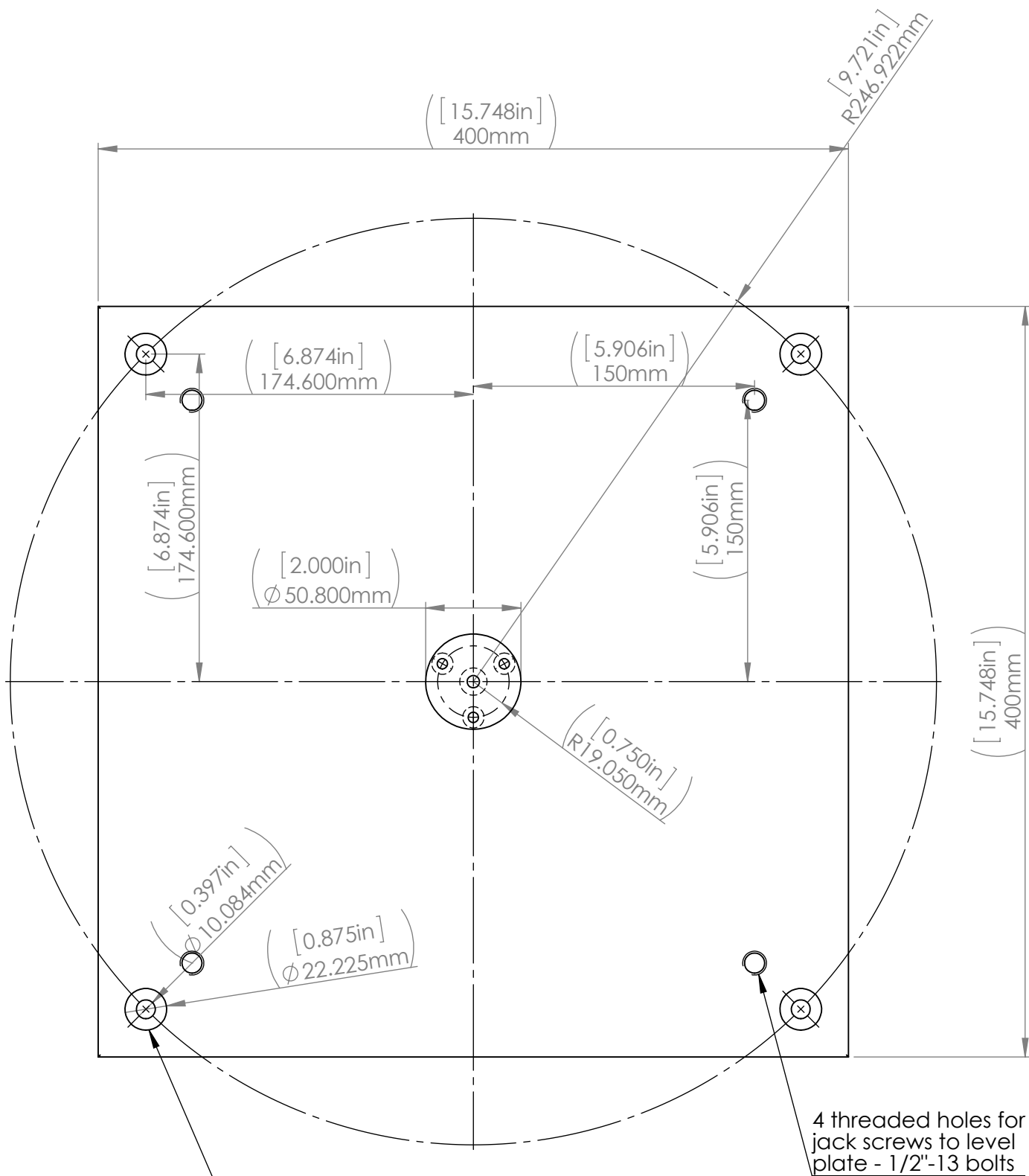
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Various

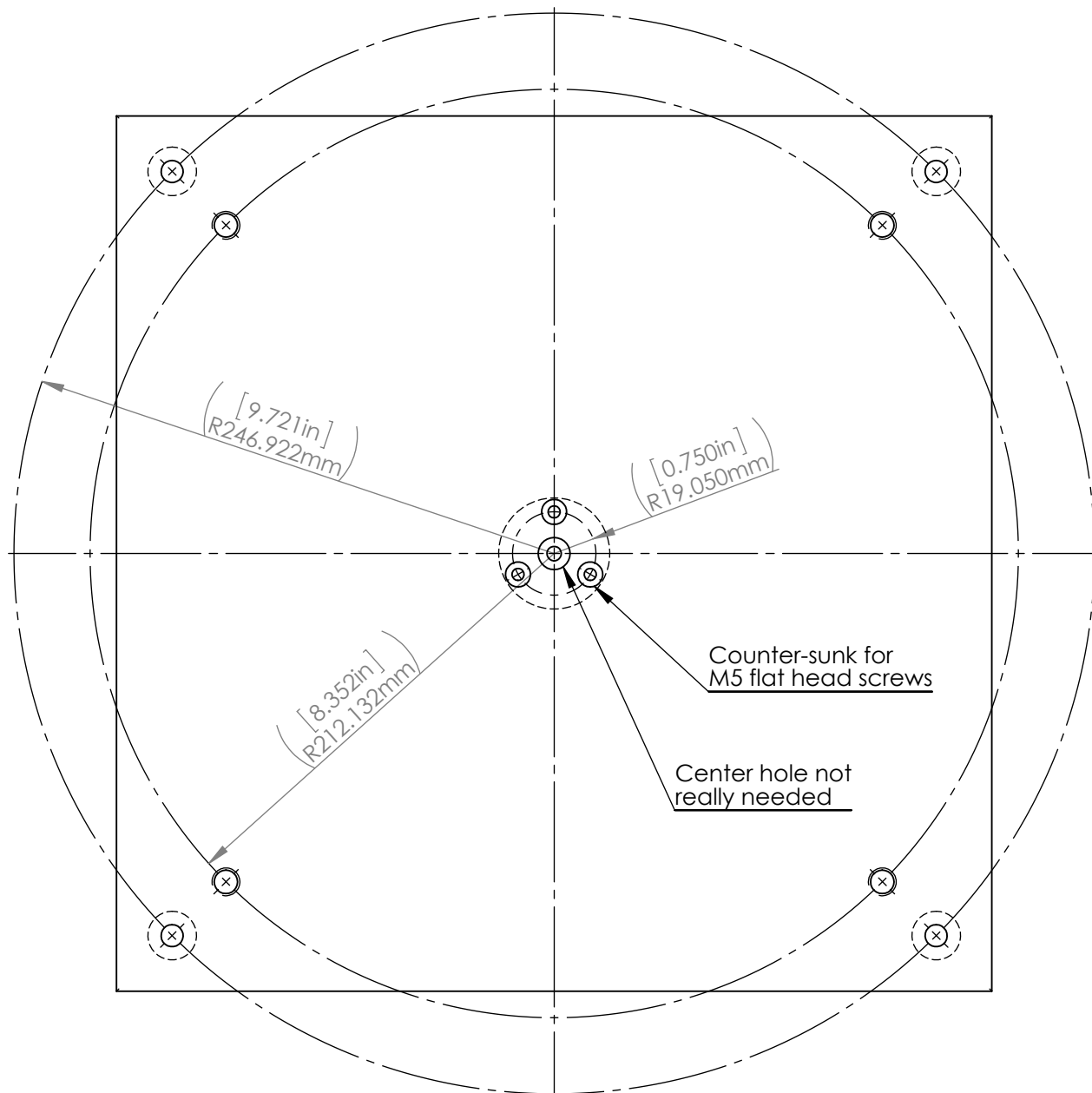
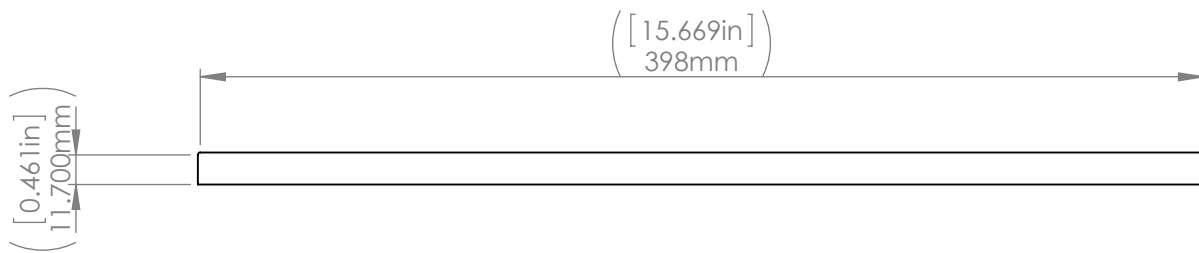
PART:

River Turbine Drive Assembly



These holes are counter-bored for 3/8" hex head screws.

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 stainless steel set pin for shaft.
DRAWN BY	NAME	DATE	
  			PART: River Turbine Base Plate
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES



VIEW: SIDE, BOTTOM

NOTES:

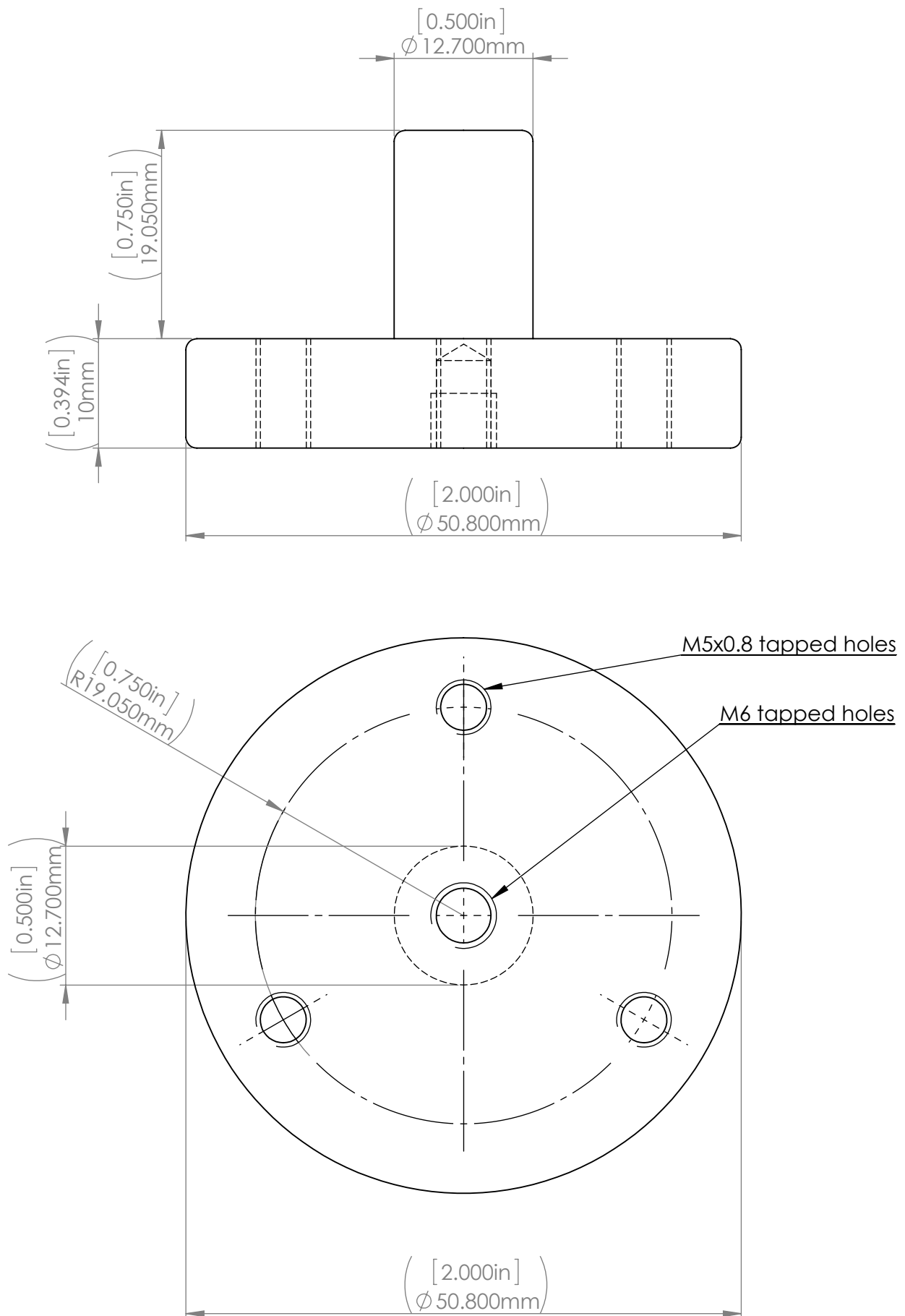
DRAWN BY: NAME: DATE: SolidWorks Student Edition.

SAFL UNIVERSITY OF MINNESOTA Steel

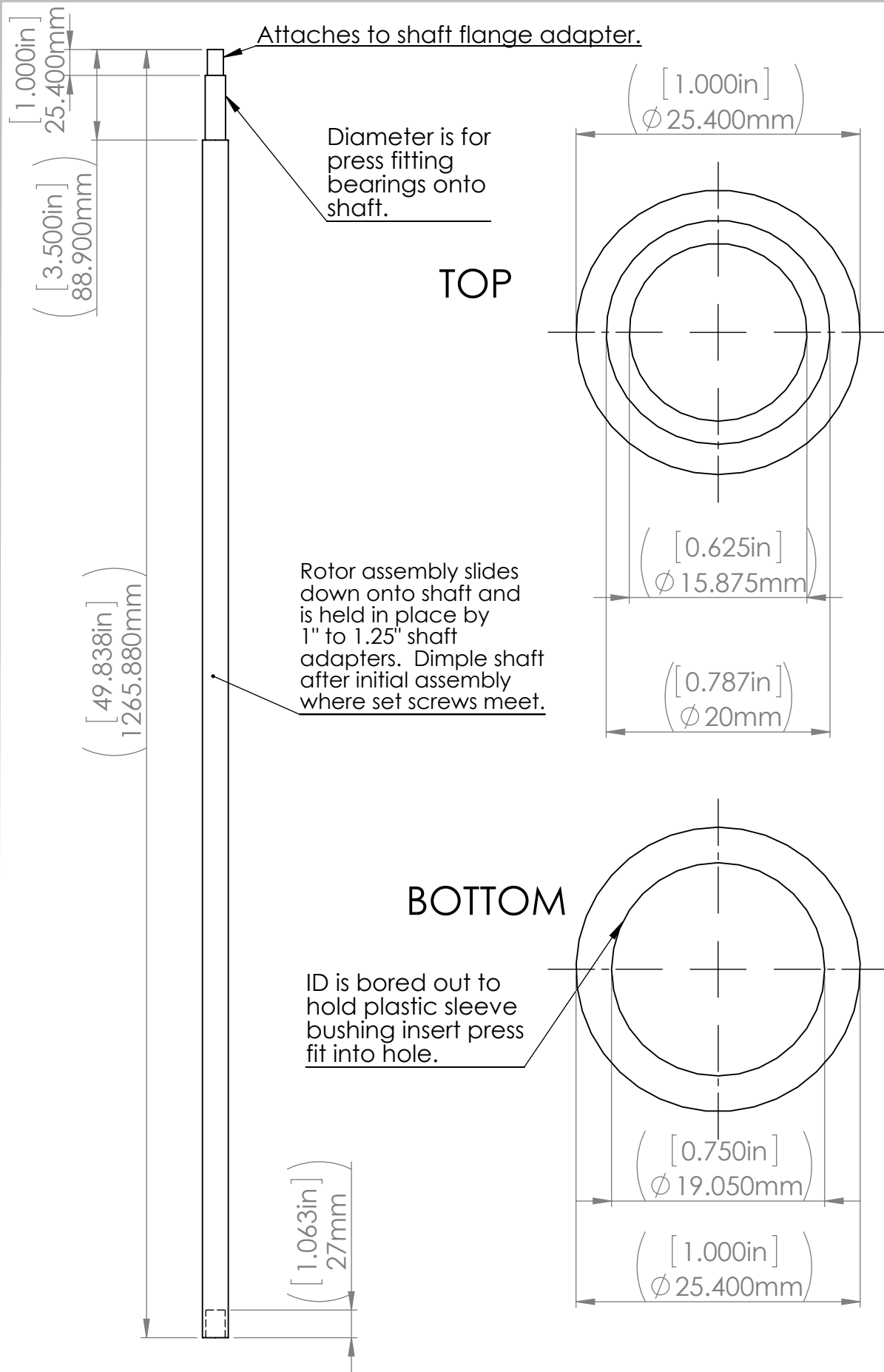
PART: River Turbine Base Plate

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

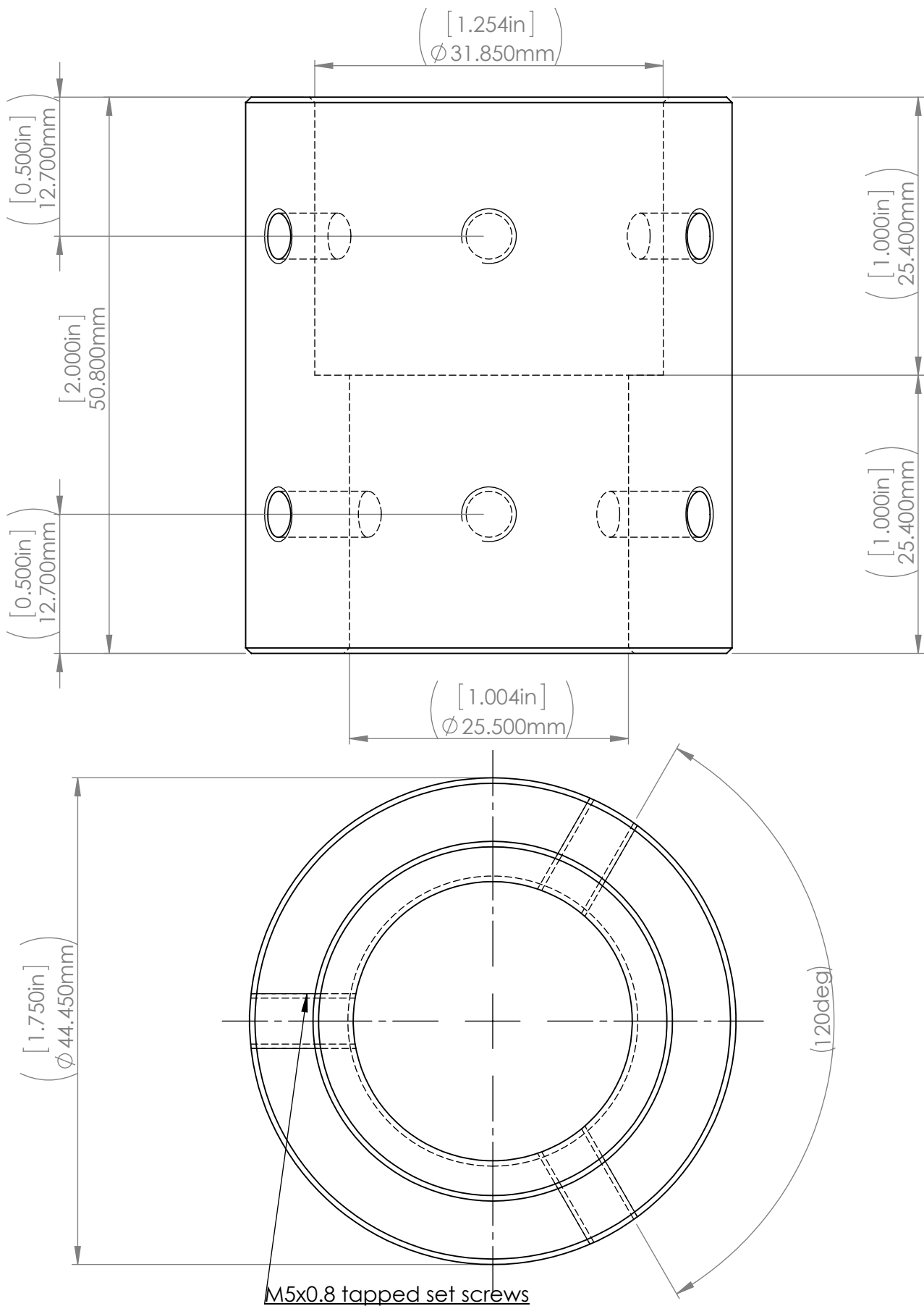
U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES



VIEW: BOTTOM, SIDE			NOTES: Stainless steel set pin mounts to center of base plate. Half inch stem provides pin for plastic sleeve bushing and shaft to slide over.	
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SAFL	UNIVERSITY OF MINNESOTA	ST. ANTHONY FALLS LABORATORY	PART: Stainless Steel	River Turbine Set Pin
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



VIEW: All Views			NOTES: Long main shaft for each rotor assembly. Plastic sleeve bushing inserts into bottom which aligns shaft with set pin on floor plate. Top of shaft is turned down to have 2 bearings press fit onto shaft.
DRAWN BY	NAME	DATE	
SolidWorks Student Edition. For Academic Use Only.			PART: River Turbine Long Shaft
SAFL	UNIVERSITY OF MINNESOTA	UNIVERSITY OF MINNESOTA	Stainless Steel
UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)			U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES



VIEW:

SIDE, TOP

NOTES:

Custom made shaft adapters to attach rotor assembly to the main drive shaft. Pre-made purchased ones were much larger in OD and length, so more intrusive.

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NAME

DATE

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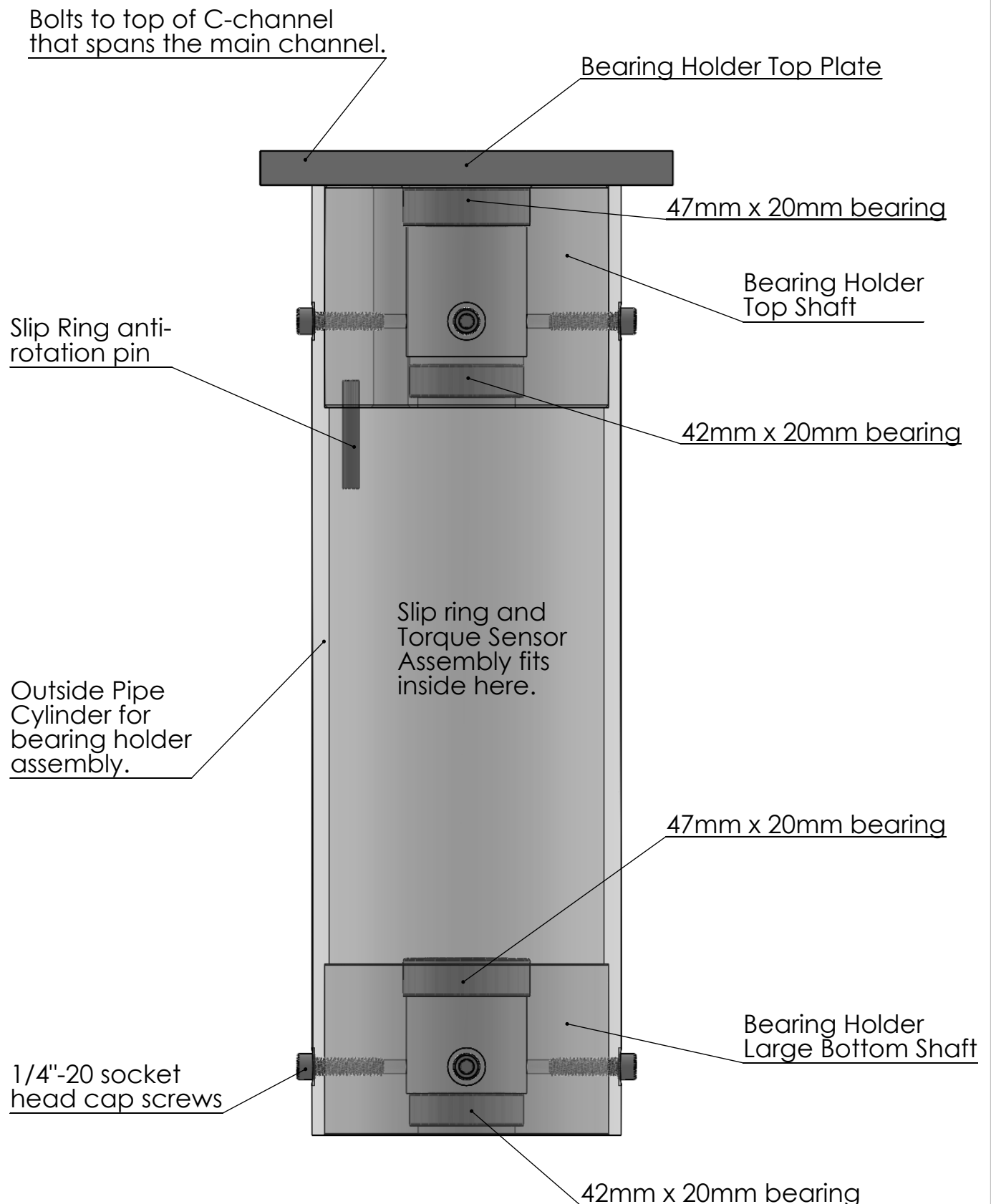


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Stainless Steel

PART:

Shaft Adapters



VIEW:

SIDE

NOTES:

The bearings are press fit onto each shaft before setting into the holder assembly. The torque sensor and slip ring assembly fits inside this pipe for added protection. The outer large cylinder is welded to the top plate for a strong connection.

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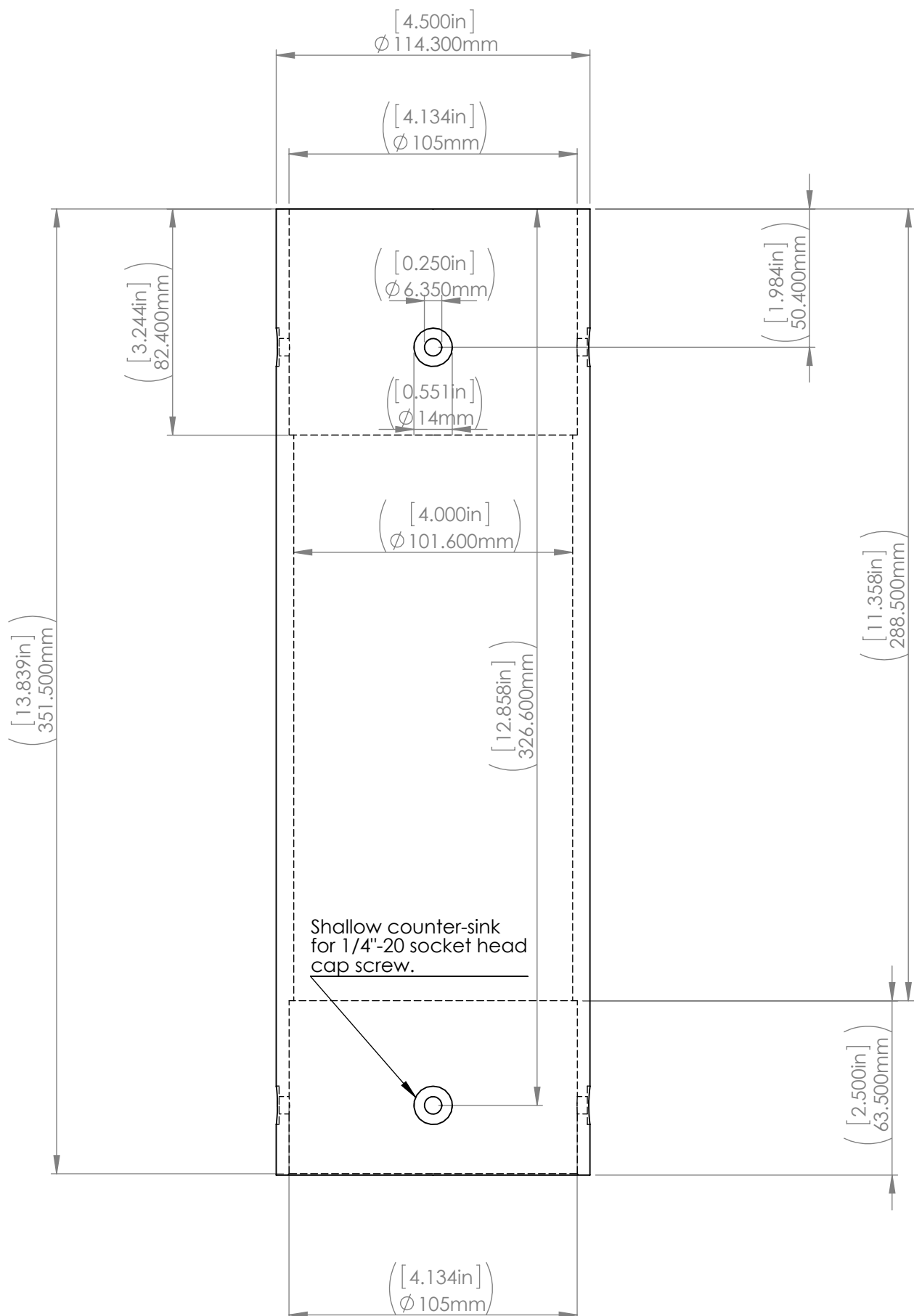





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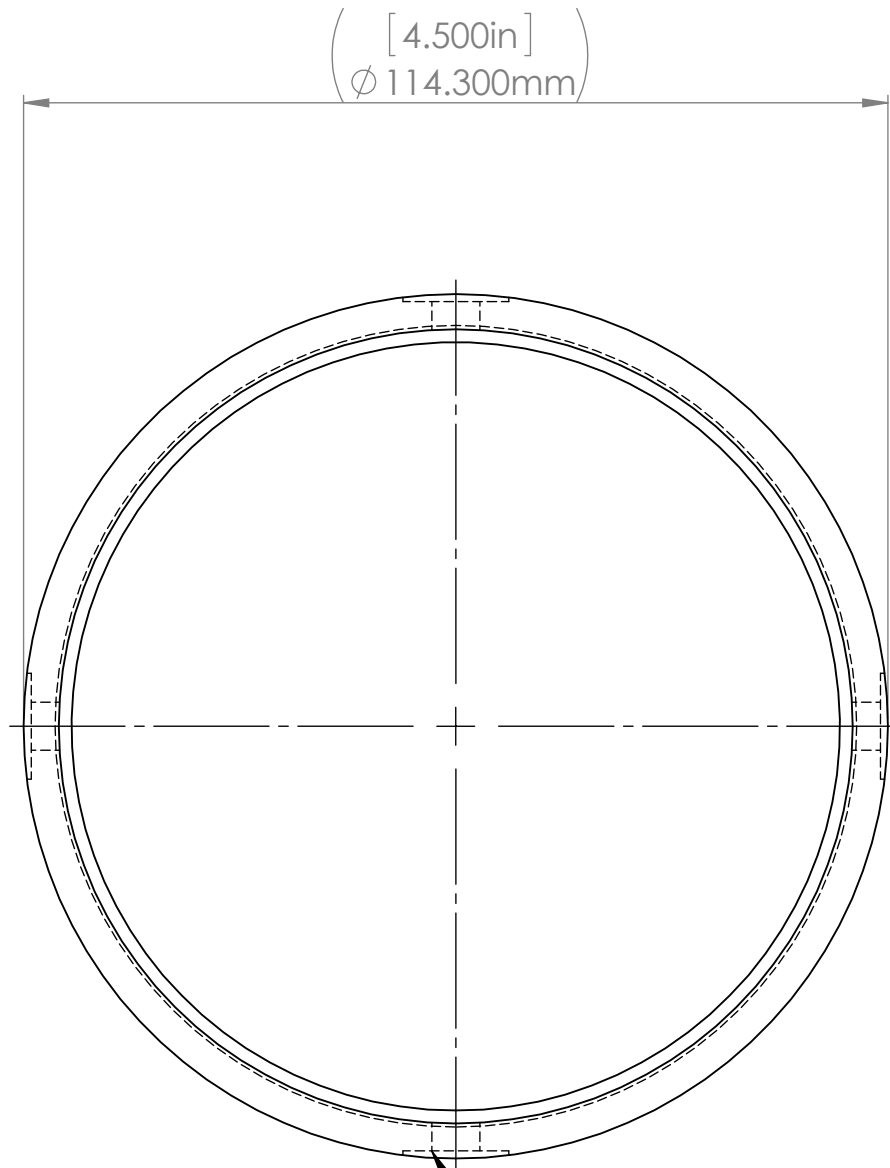
Aluminum

PART:




Bearing Holder Assembly

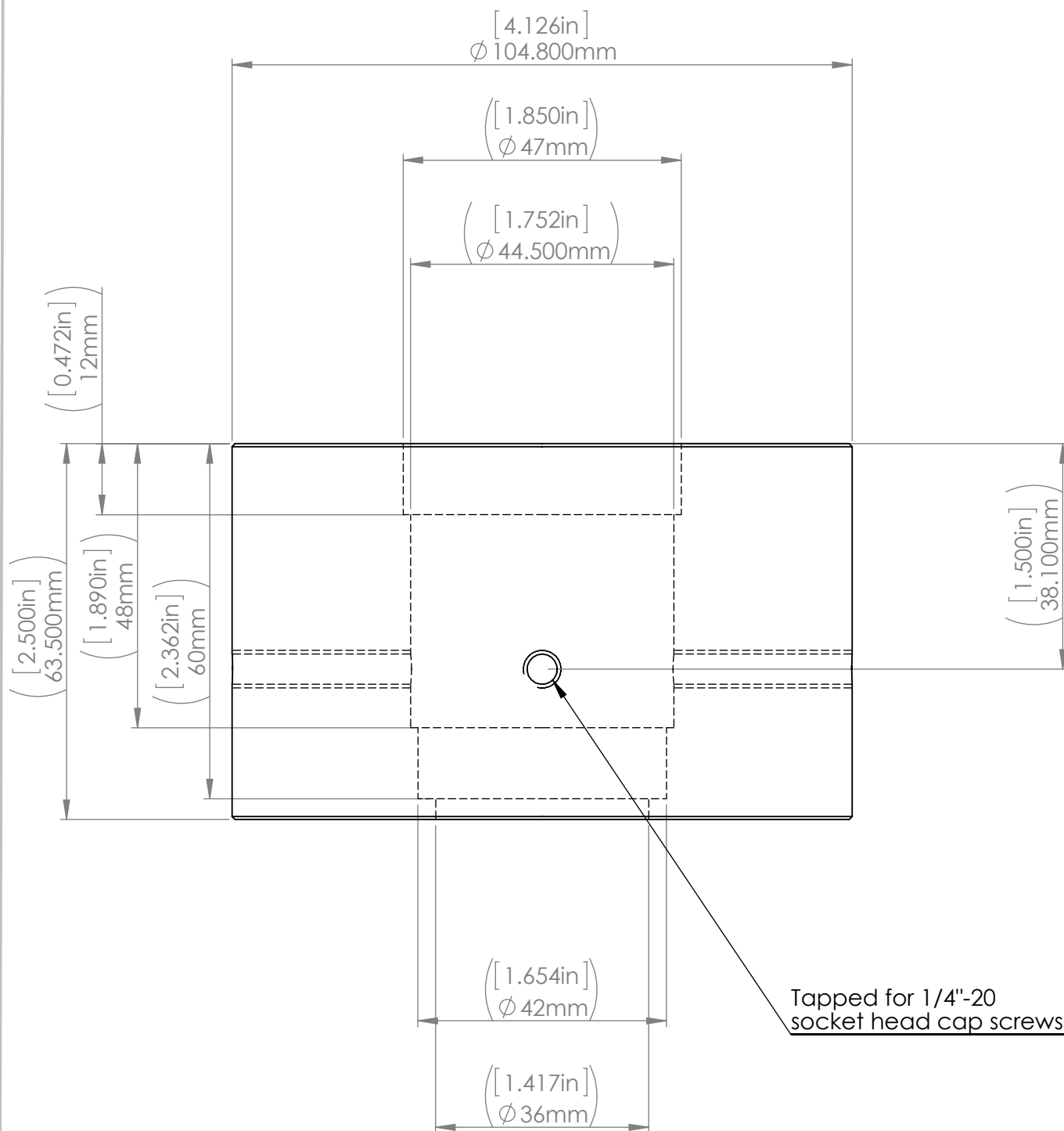


VIEW: SIDE			NOTES: Outside large pipe that houses bearing holders, slip ring, torque sensor, and is welded to the top plate that attaches to the C-channel that spans the main channel.
DRAWN BY	NAME	DATE	
<div>    </div>			PART: Bearing Holder - Outside Pipe
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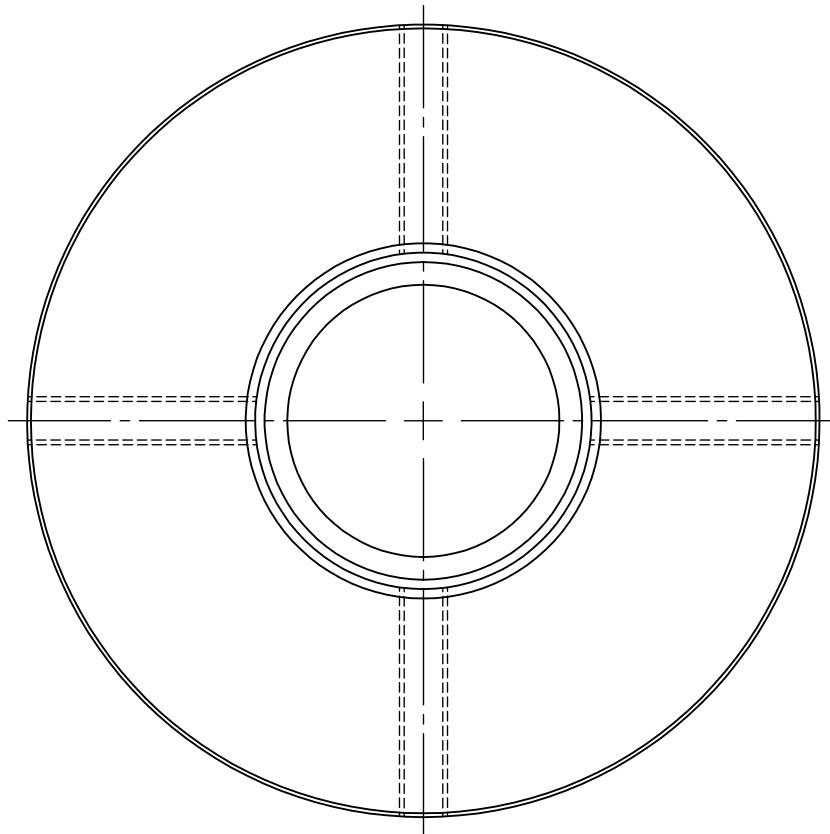





Shallow counter-sink for 1/4"-20
socket head cap screw.

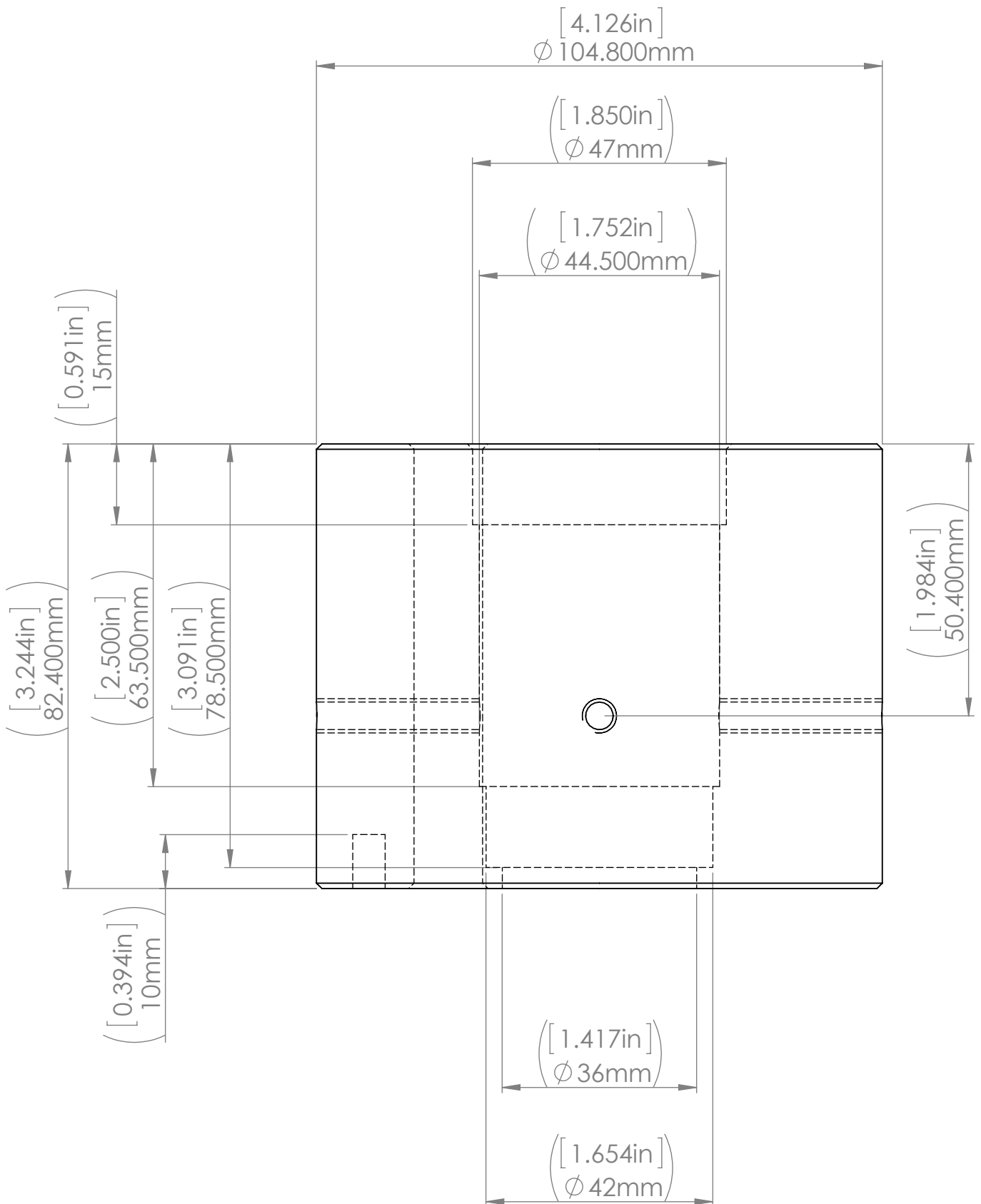
VIEW: TOP			NOTES: Outside large pipe that houses bearing holders, slip ring, torque sensor, and is welded to the top plate that attaches to the C-channel that spans the main channel.	
DRAWN BY	NAME	DATE		
  			PART: Bearing Holder Outside Pipe	
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VIEW: SIDE			NOTES: Bearing Holder that attaches into the bottom of the larger outside pipe for the bearing holder assembly. The long shaft and bearings sit in the part and drop down from the top.	
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VIEW: TOP		NOTES: Top view of Bearing Holder - Long Shaft. All dimensions are on the previous sheet.	
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UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)		PART: Bearing Holder - Long Shaft U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



VIEW: SIDE

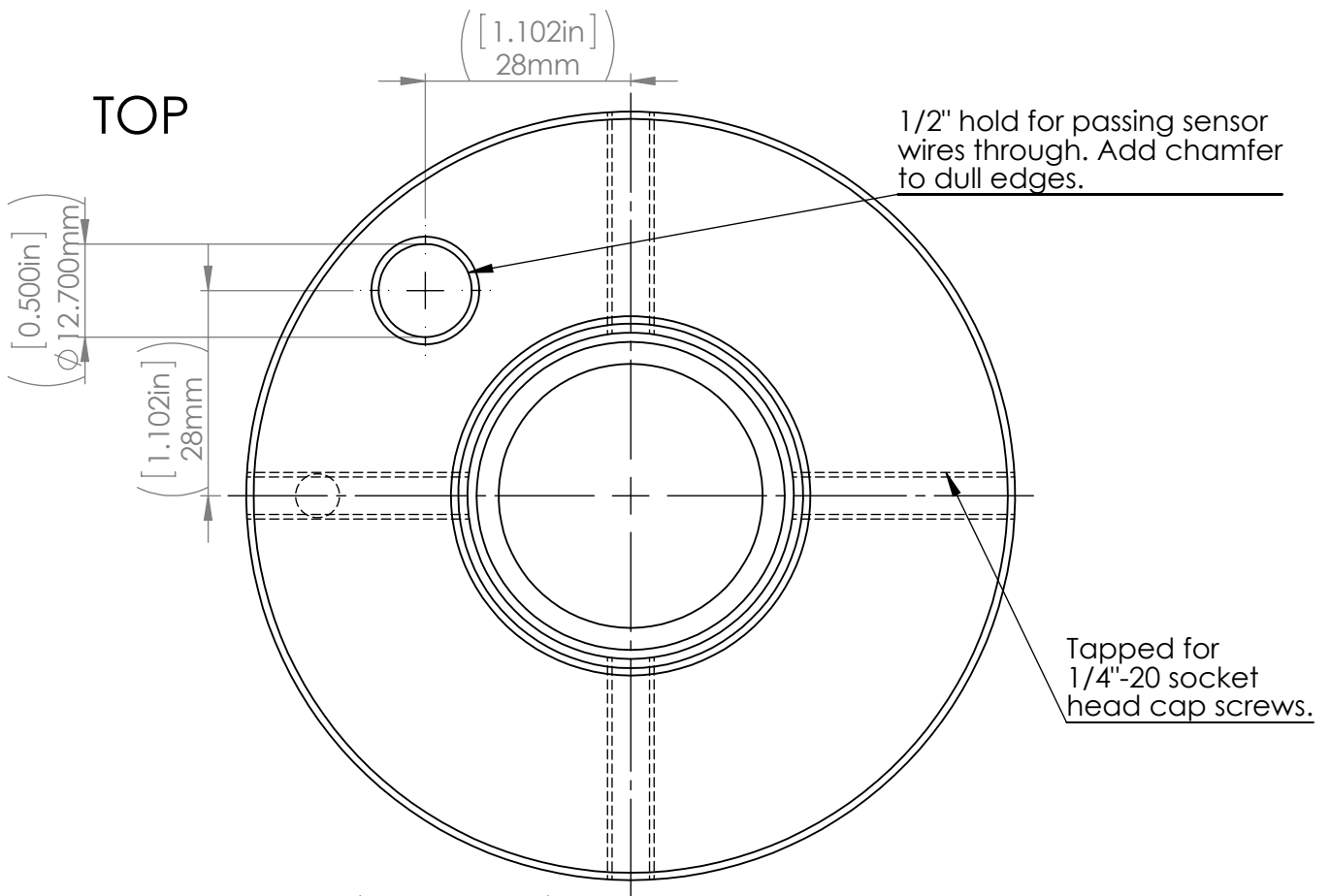
NOTES: Attaches into the top of the larger outside bearing assembly cylinder. Supports smaller top shaft and bearings coming from chain sprocket.

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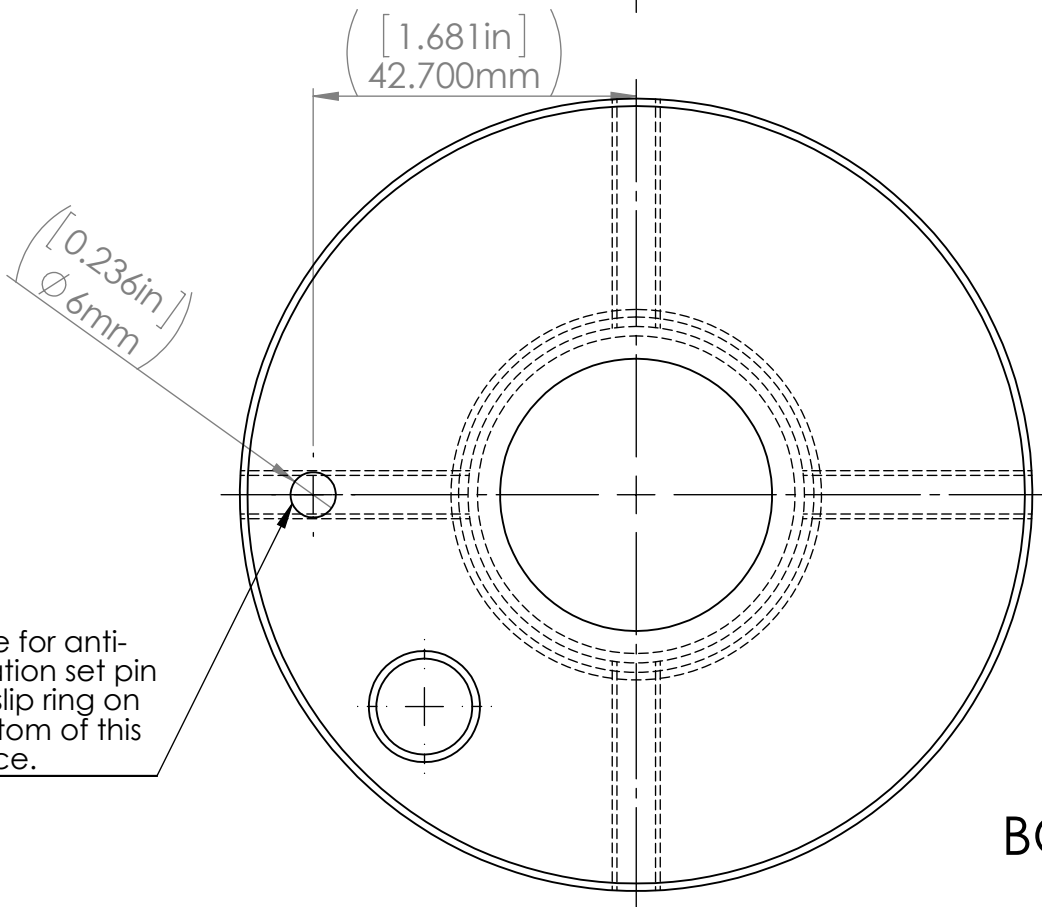
SAFL UNIVERSITY OF MINNESOTA

PART: Bearing Holder - Top Shaft

TOP



Hole for anti-rotation set pin for slip ring on bottom of this piece.



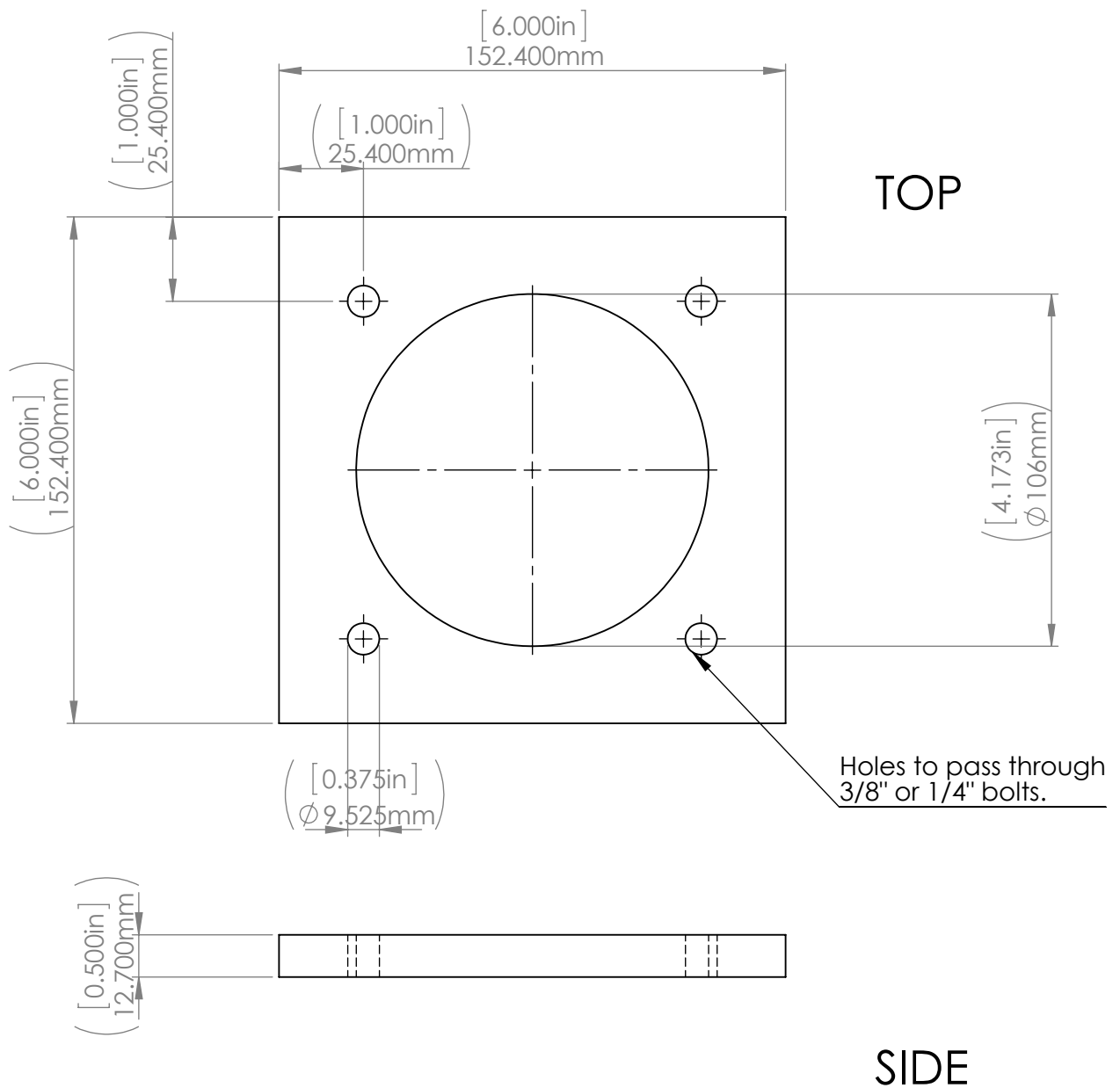
BOTTOM




VIEW: TOP, BOTTOM

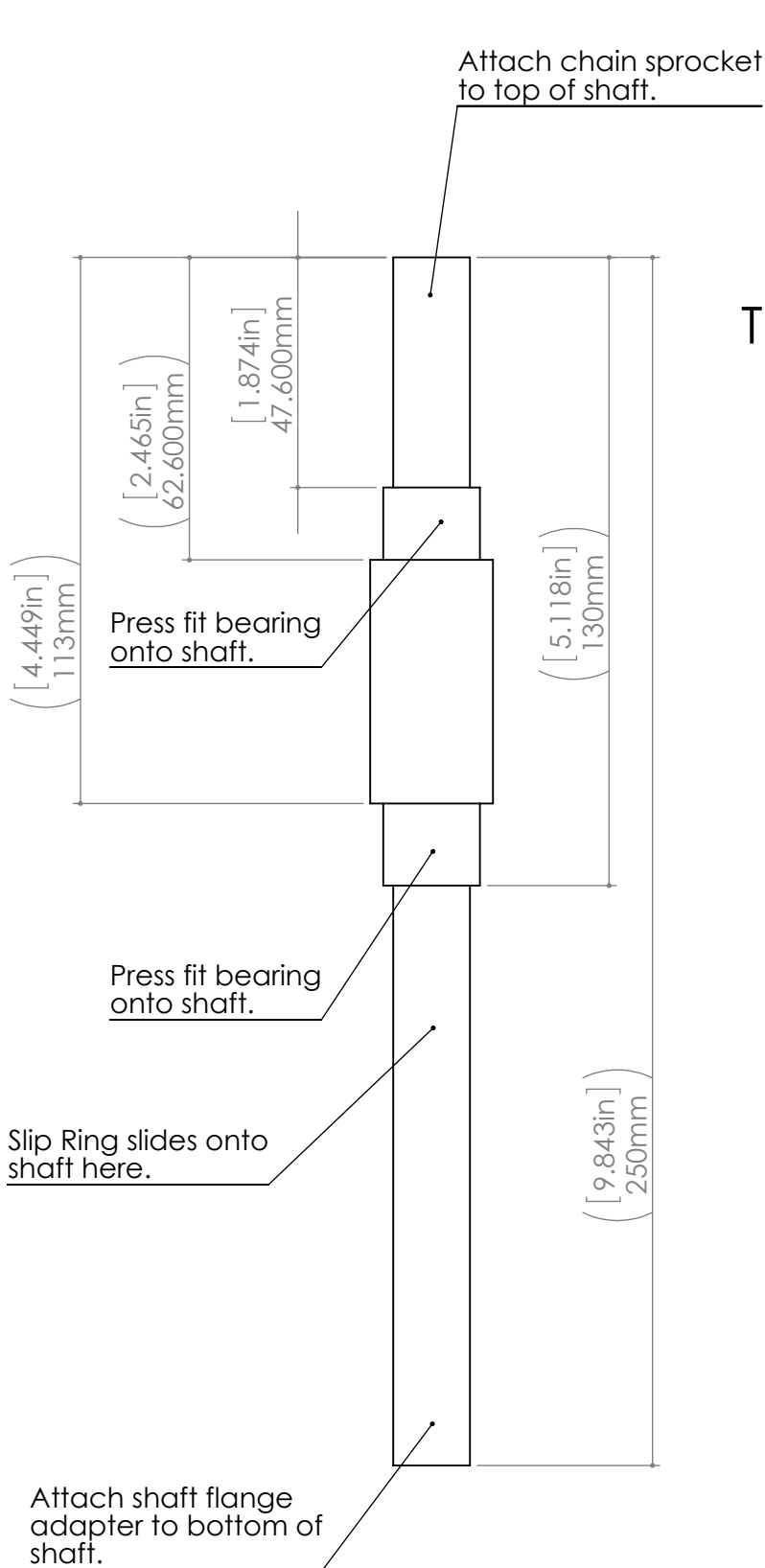
NOTES: Attaches into the top of the larger outside bearing assembly cylinder. Supports smaller top shaft and bearings coming from chain sprocket.

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 Aluminum

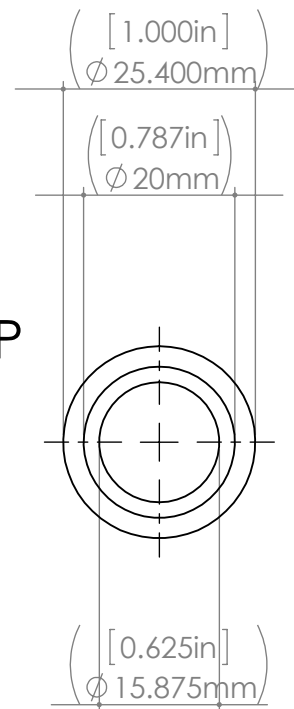
PART: Bearing Holder - Top Shaft



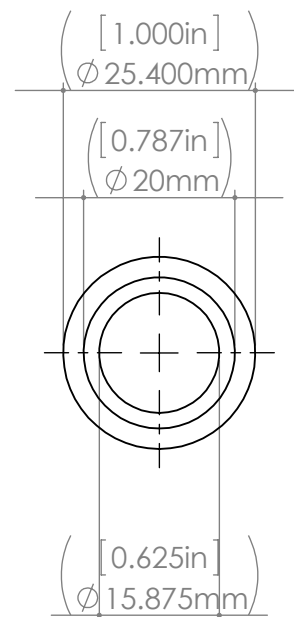
VIEW: TOP, SIDE		NOTES: Plate is welded to the larger diameter outside bearing assembly pipe. The assembly drops down through a larger hole in the C-channel and is bolted to the top of the C-channel for location.	
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UNIVERSITY OF MINNESOTA (UMN) - ST. ANTHONY FALLS LABORATORY (SAFL)		PART: Bearing Holder Top Plate U.S. DEPARTMENT OF ENERGY REFERENCE HYDROKINETIC TURBINES	



TOP



BOTTOM



VIEW:

ALL VIEWS

NOTES:

Top short shaft that attaches to one side of the torque sensor, holds slip ring assembly, has 2 bearings press fit onto shaft, and has the chain sprocket for the drive system.

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NAME

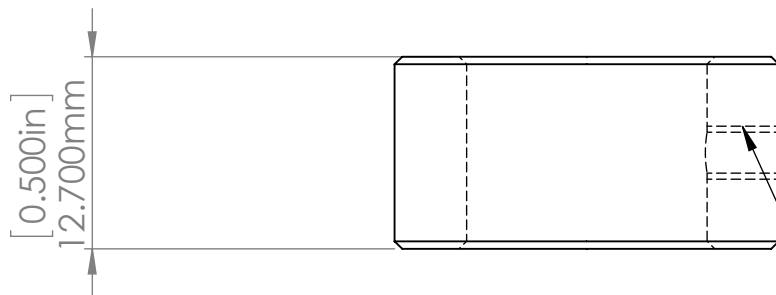
DATE



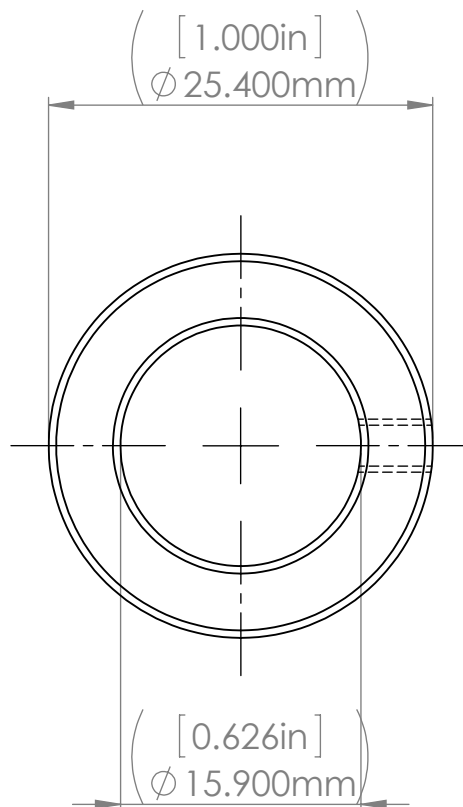
Steel

PART:

River Turbine Top Short Shaft



Tapped hole for
#6-32 set screws



VIEW:

TOP, SIDE

NOTES:

Small shaft collar to attach below the slip ring to help support and make sure it doesn't shift down. Slightly smaller OD than available from McMaster, but needed to avoid interference with wires.

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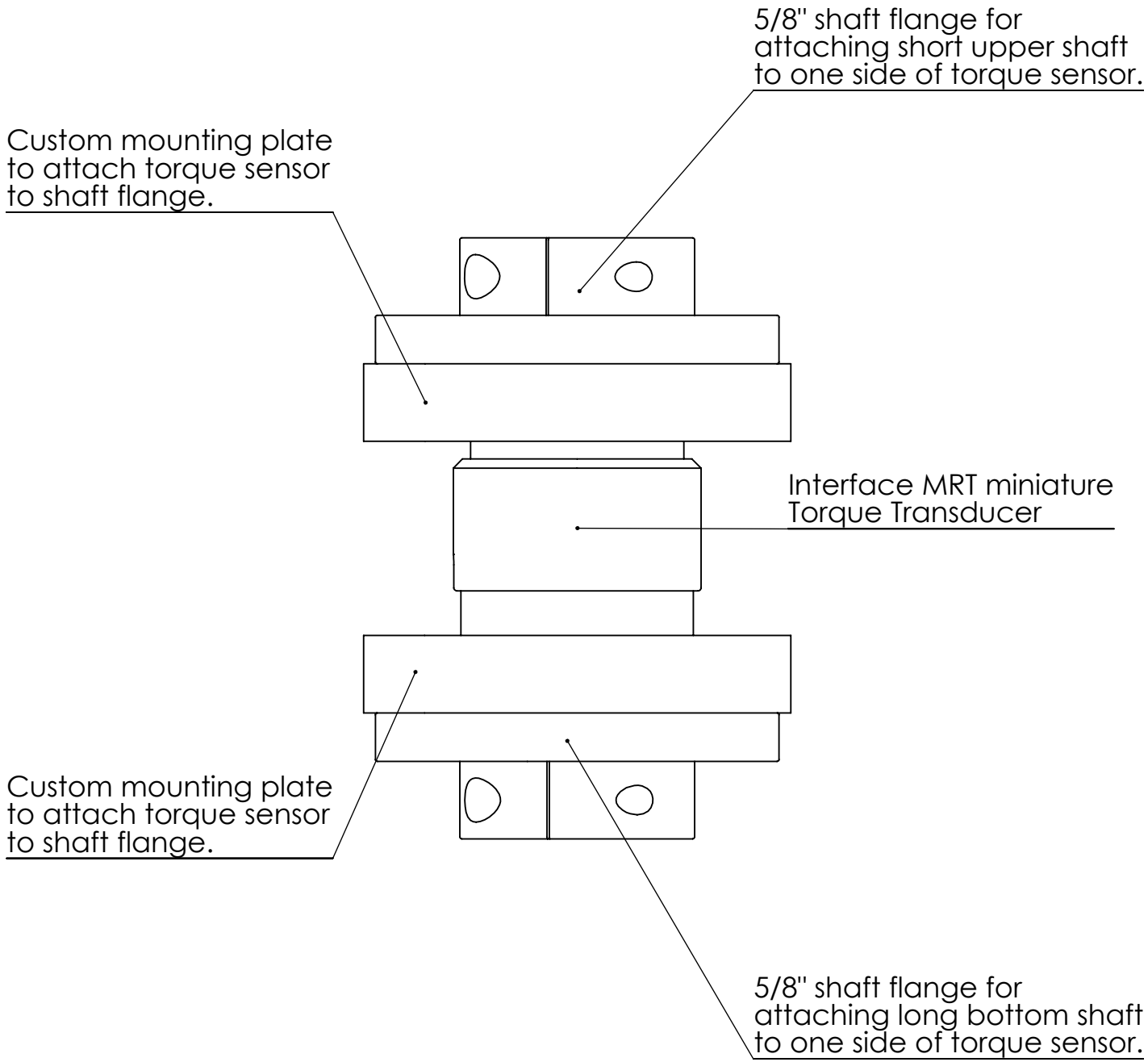
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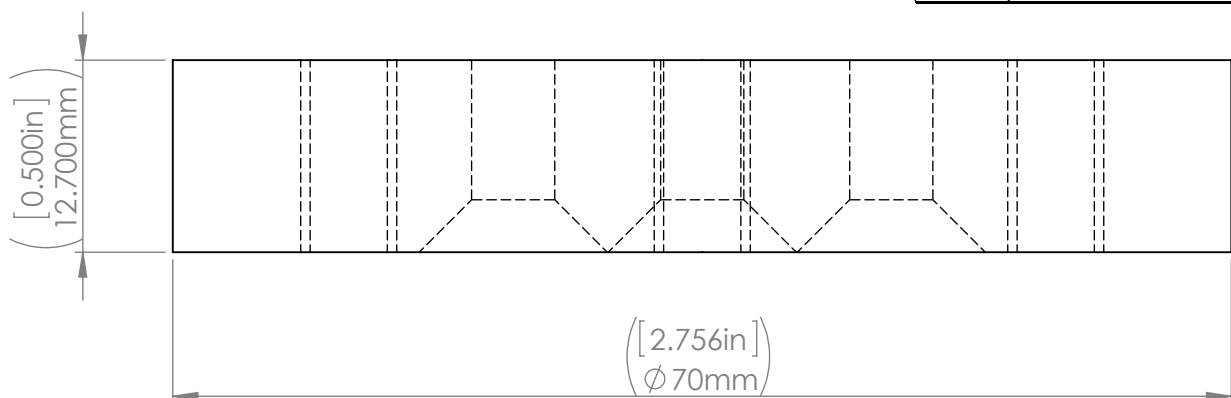
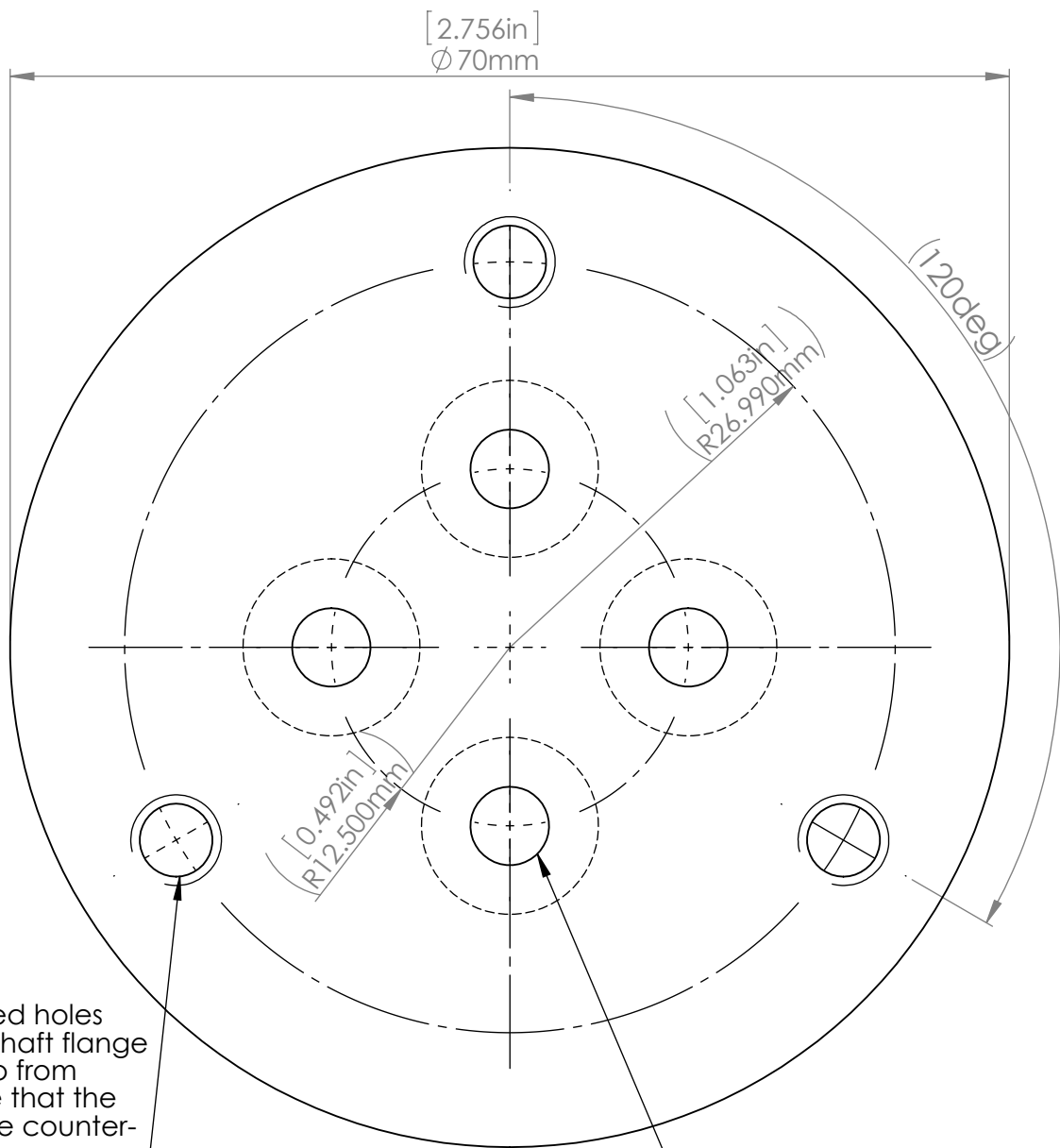
Aluminum

PART:

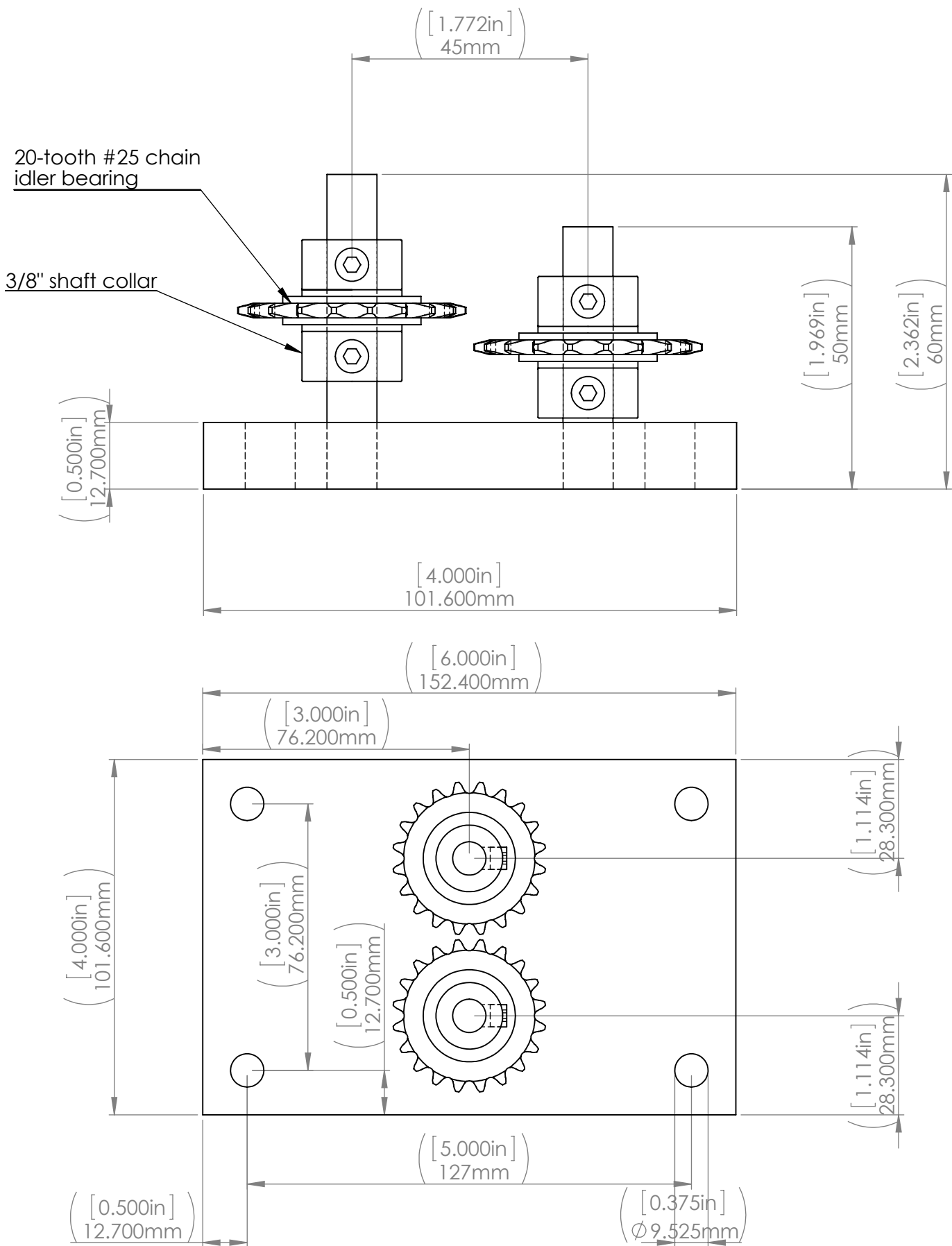
Slip Ring stopper



VIEW: SIDE		NOTES:	
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			PART: River Turbine - Torque Assembly
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VIEW: TOP, SIDE		NOTES: These plates mount to each side of the torque sensor for the river turbine assembly and provide a mounting surface for the 5/8" shaft flanges.	
DRAWN BY	NAME	DATE	
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VIEW:

TOP, SIDE

NOTES:

Idler bearing assembly that bolts to the top of the C-channel that spans the main channel.

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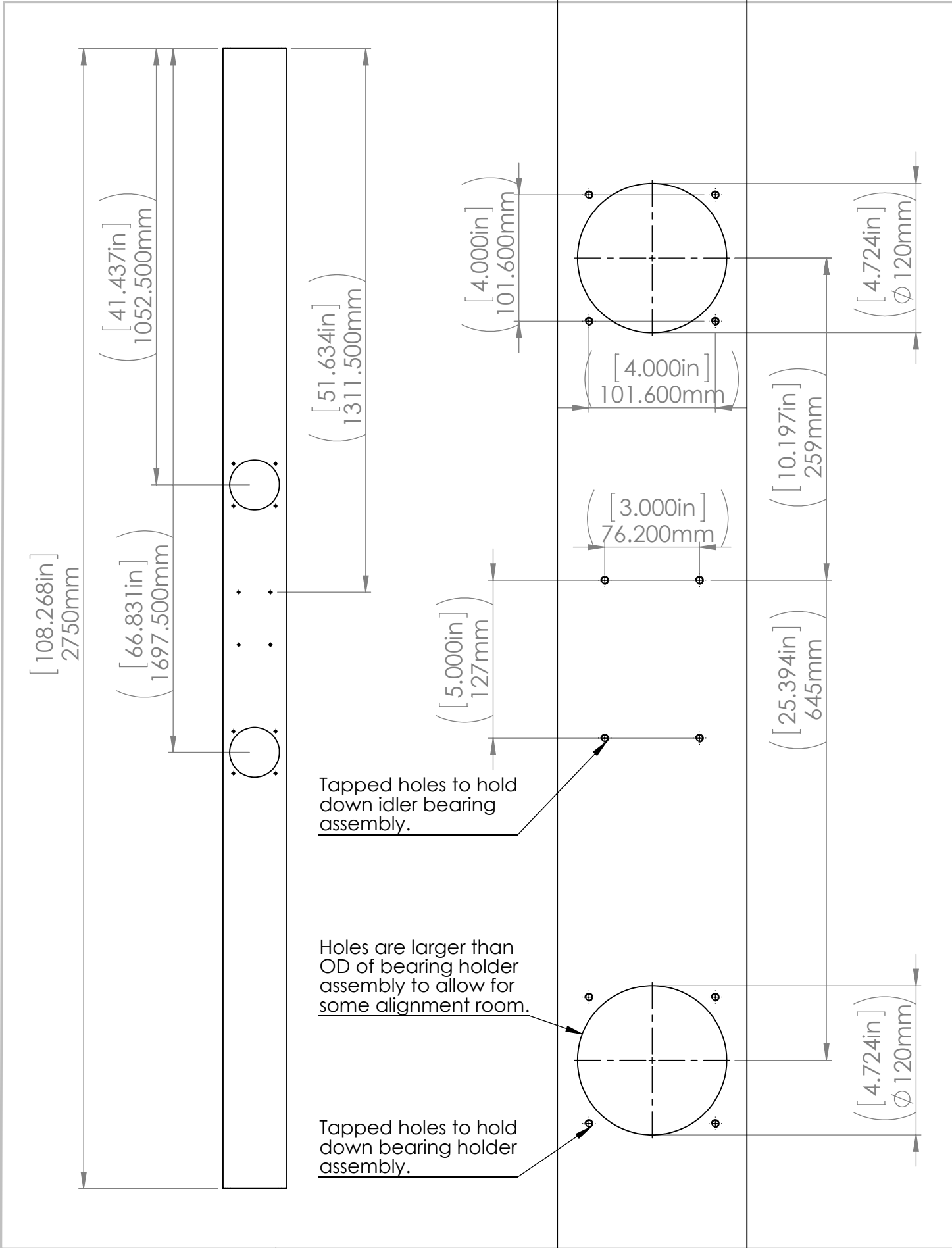





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Aluminum

PART:

River Turbine Idler Bearing Assembly



VIEW: TOP			NOTES: C-channel that needs to be structurally support to the main channel walls, but low enough that DAQ carriage can pass over the top. Perhaps weld flanges on each end that can get into the T-slots on the side of the channel.		
DRAWN BY	NAME	DATE			
  			PART: River Turbine C-Channel		
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