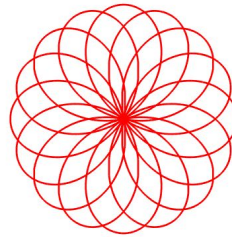
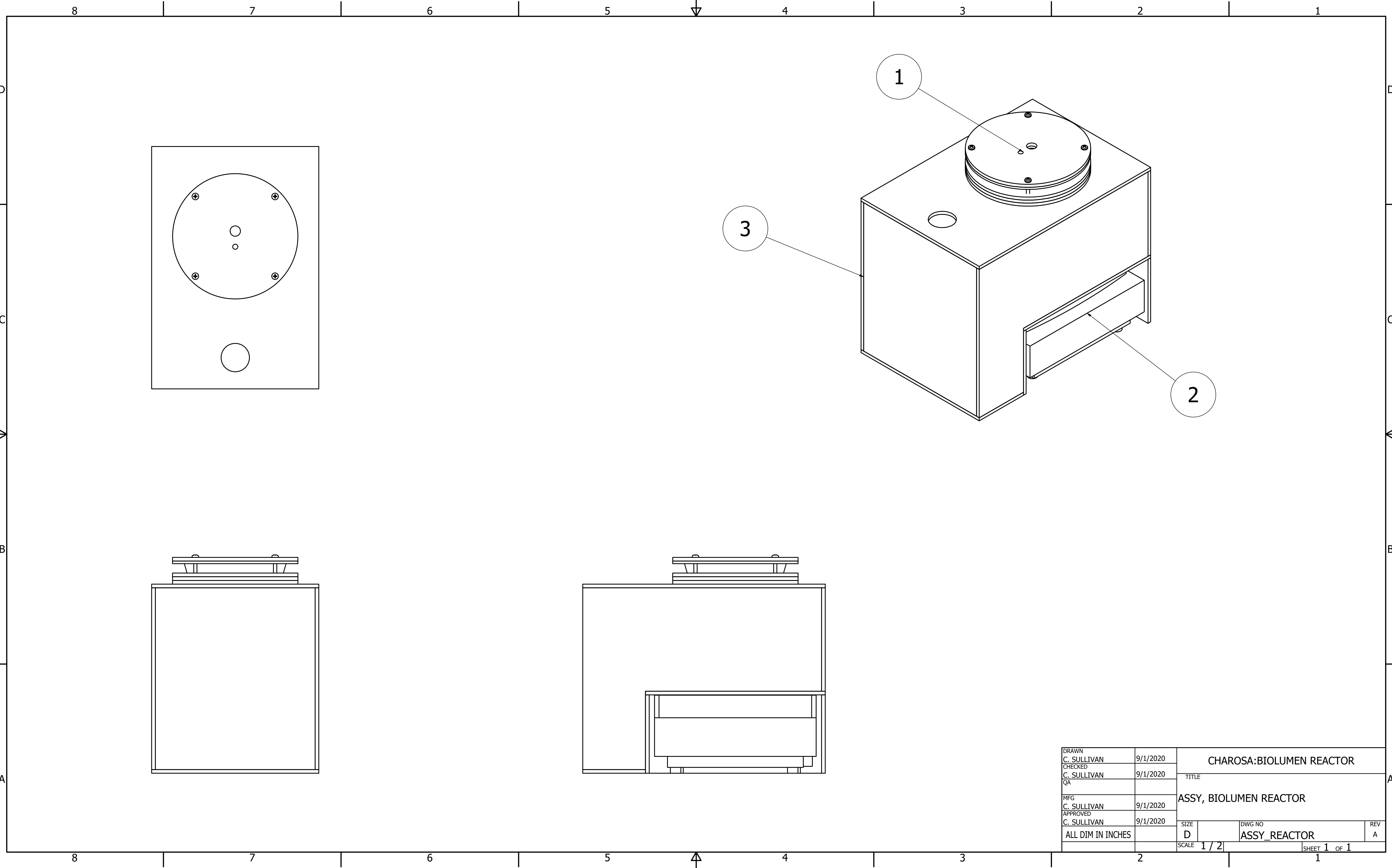


BioLumen Reactor Engineering Drawings

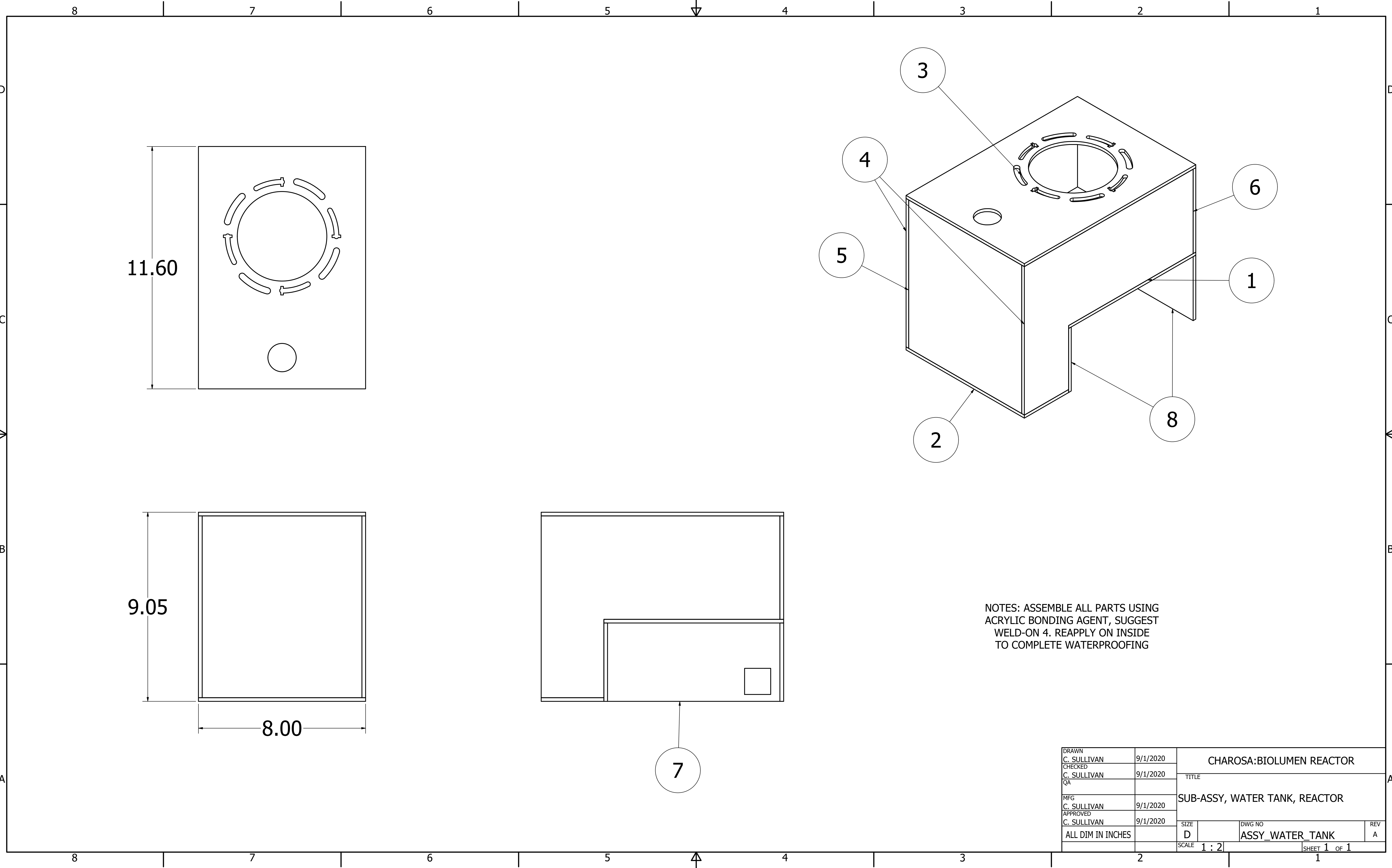


Author(s): Conor Sullivan

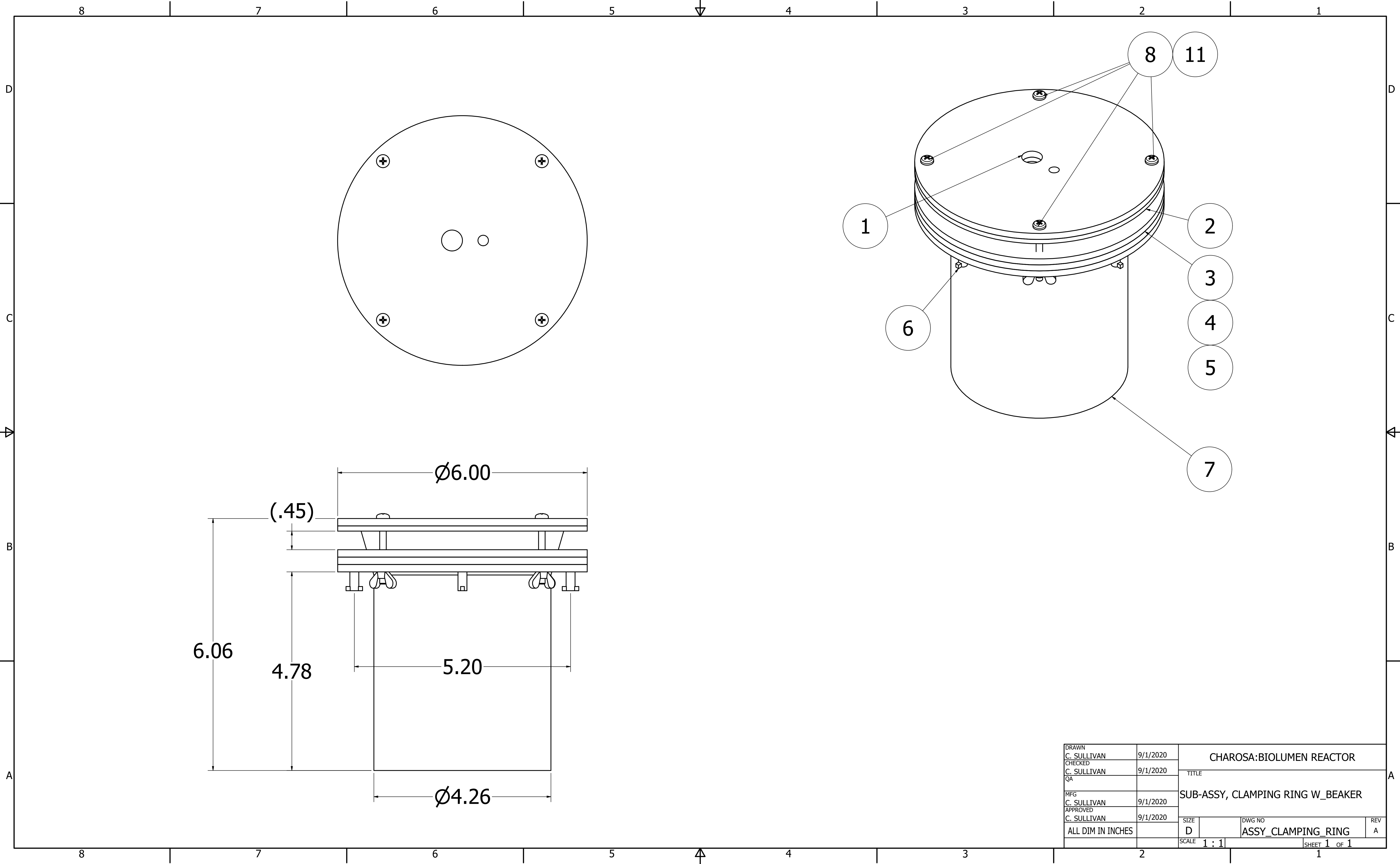
Charosa Research Incubator, University of Minnesota - Twin Cities



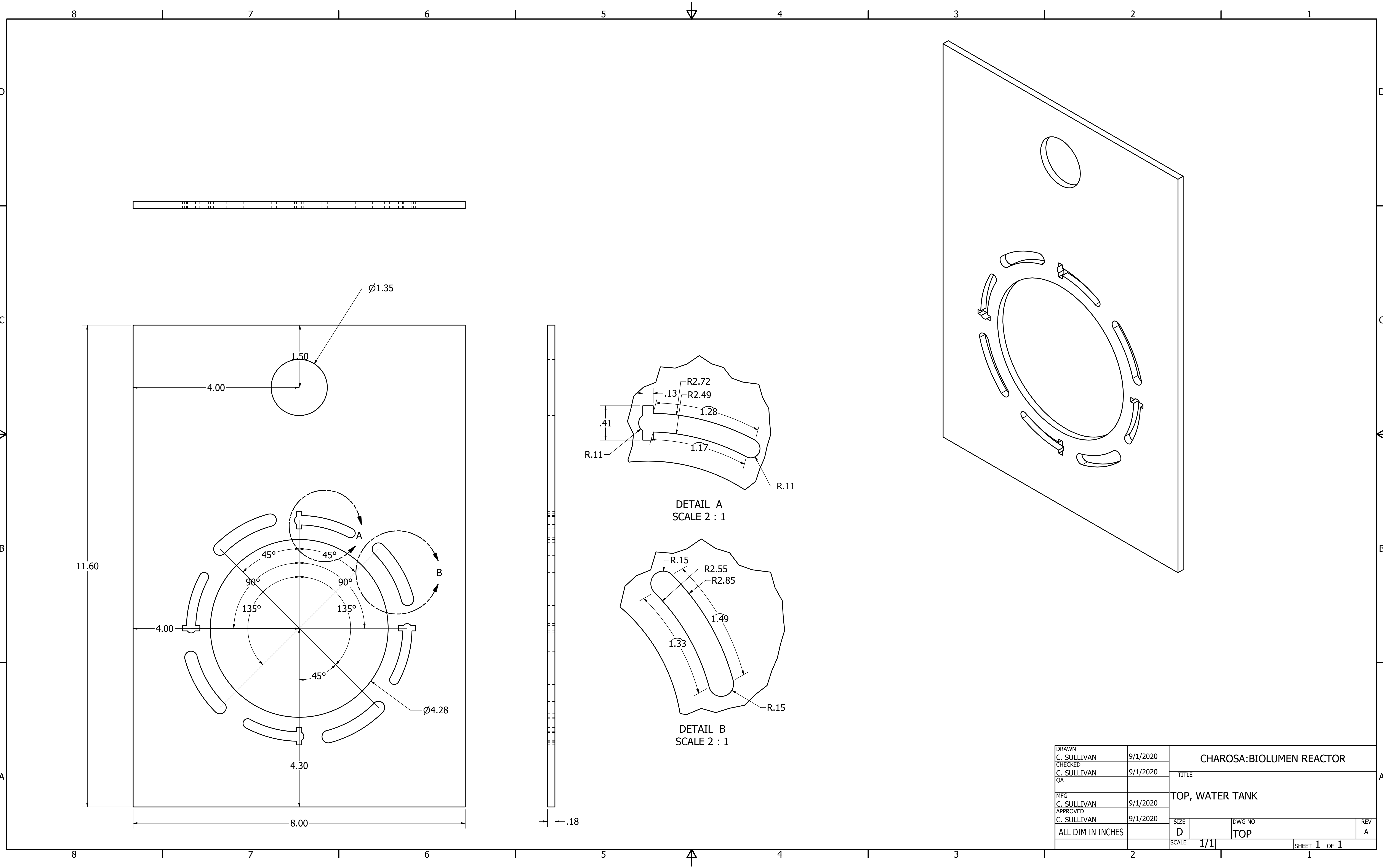
DRAWN C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR		
CHECKED C. SULLIVAN	9/1/2020	TITLE		
QA		ASSY, BIOLUMEN REACTOR		
MFG C. SULLIVAN	9/1/2020			
APPROVED C. SULLIVAN	9/1/2020	SIZE D	DWG NO ASSY_REACTOR	REV A
ALL DIM IN INCHES		SCALE 1 / 2	SHEET 1 OF 1	

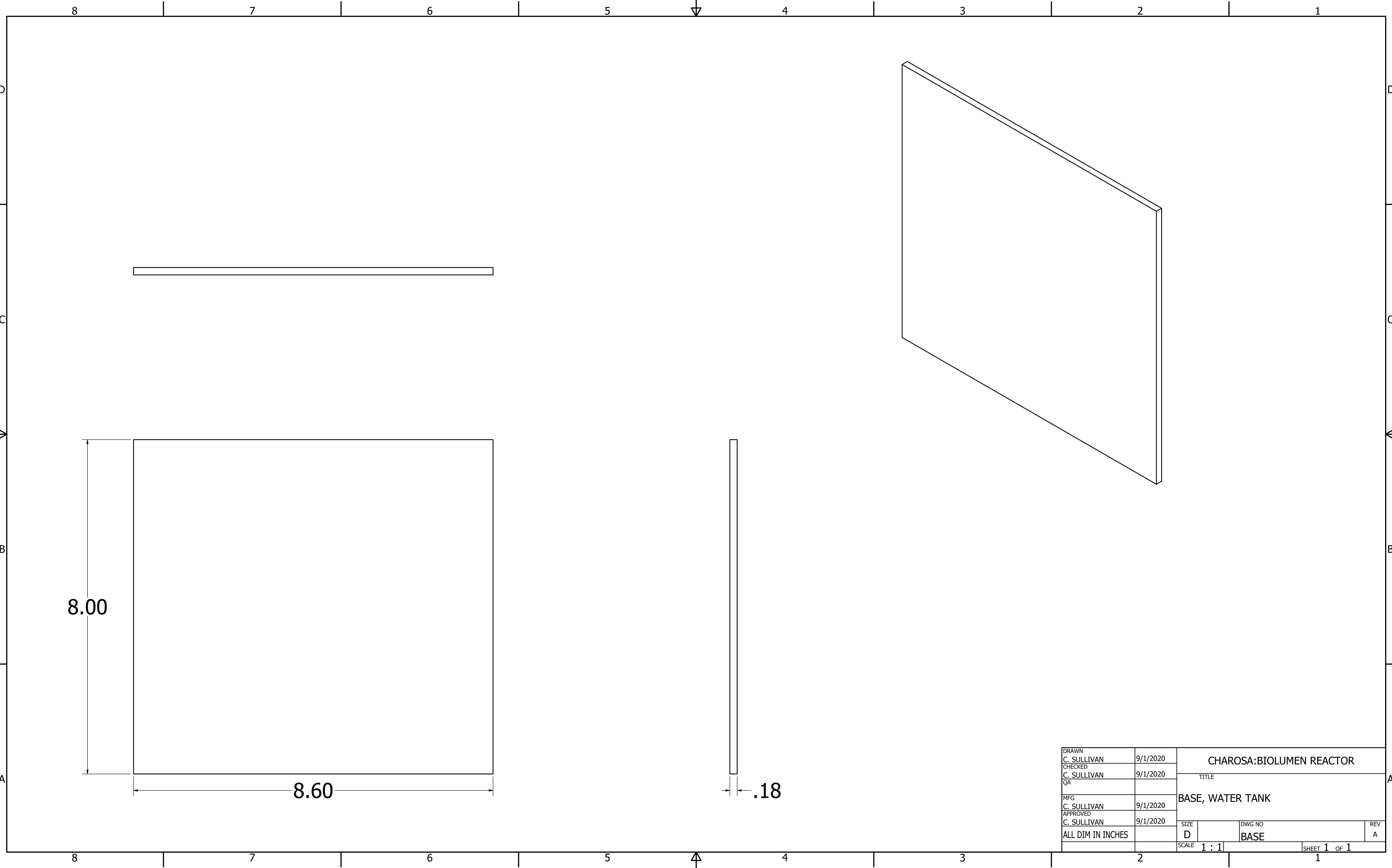


DRAWN C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR		
CHECKED C. SULLIVAN	9/1/2020	TITLE		
QA		SUB-ASSY, WATER TANK, REACTOR		
MFG C. SULLIVAN	9/1/2020			
APPROVED C. SULLIVAN	9/1/2020	SIZE D	DWG NO ASSY_WATER_TANK	REV A
ALL DIM IN INCHES		SCALE 1 : 2		SHEET 1 OF 1

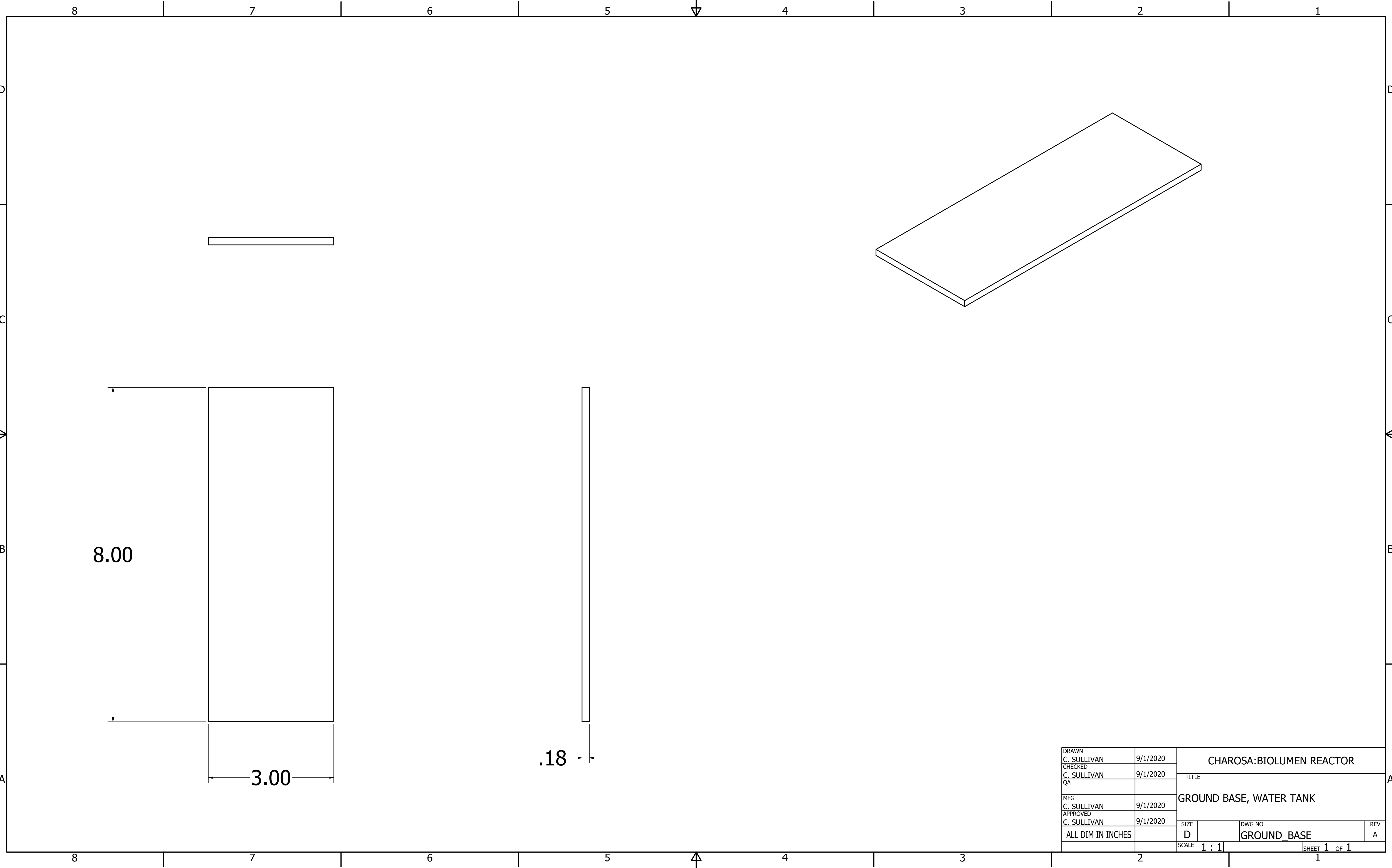


DRAWN C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR			
CHECKED C. SULLIVAN	9/1/2020	TITLE			
QA		SUB-ASSY, CLAMPING RING W_BEAKER			
MFG C. SULLIVAN	9/1/2020				
APPROVED C. SULLIVAN	9/1/2020	SIZE D	DWG NO ASSY_CLAMPING_RING	REV A	
ALL DIM IN INCHES		SCALE 1 : 1		SHEET 1 OF 1	

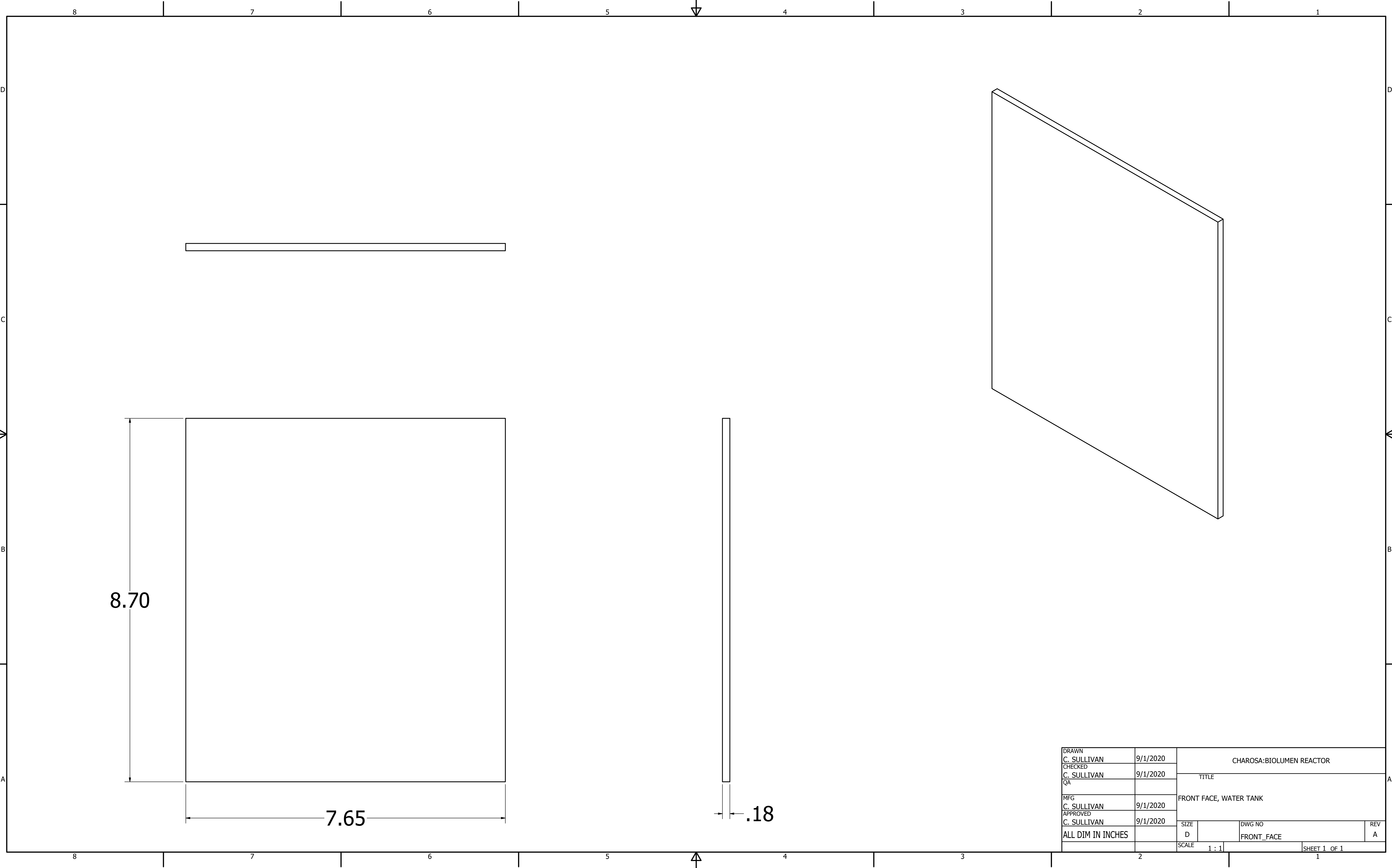


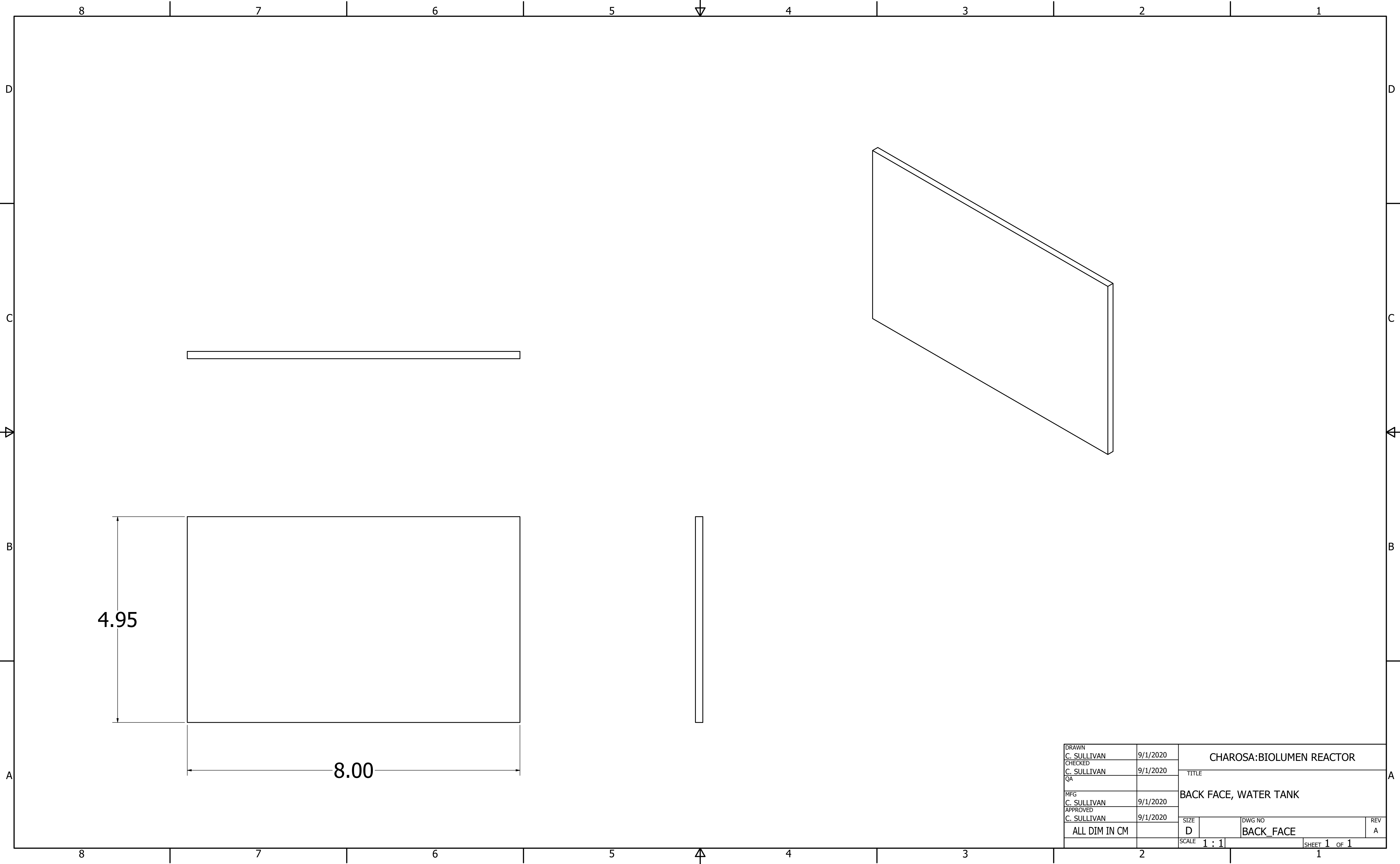


DRAWN	C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR		
CHECKED	C. SULLIVAN	9/1/2020	TITLE		
QA			BASE, WATER TANK		
MFG	C. SULLIVAN	9/1/2020	SIZE		
APPROVED	C. SULLIVAN	9/1/2020	DWG NO		
ALL DIM IN INCHES			REV		
			A		
SCALE		1 : 1	SHEET 1 OF 1		

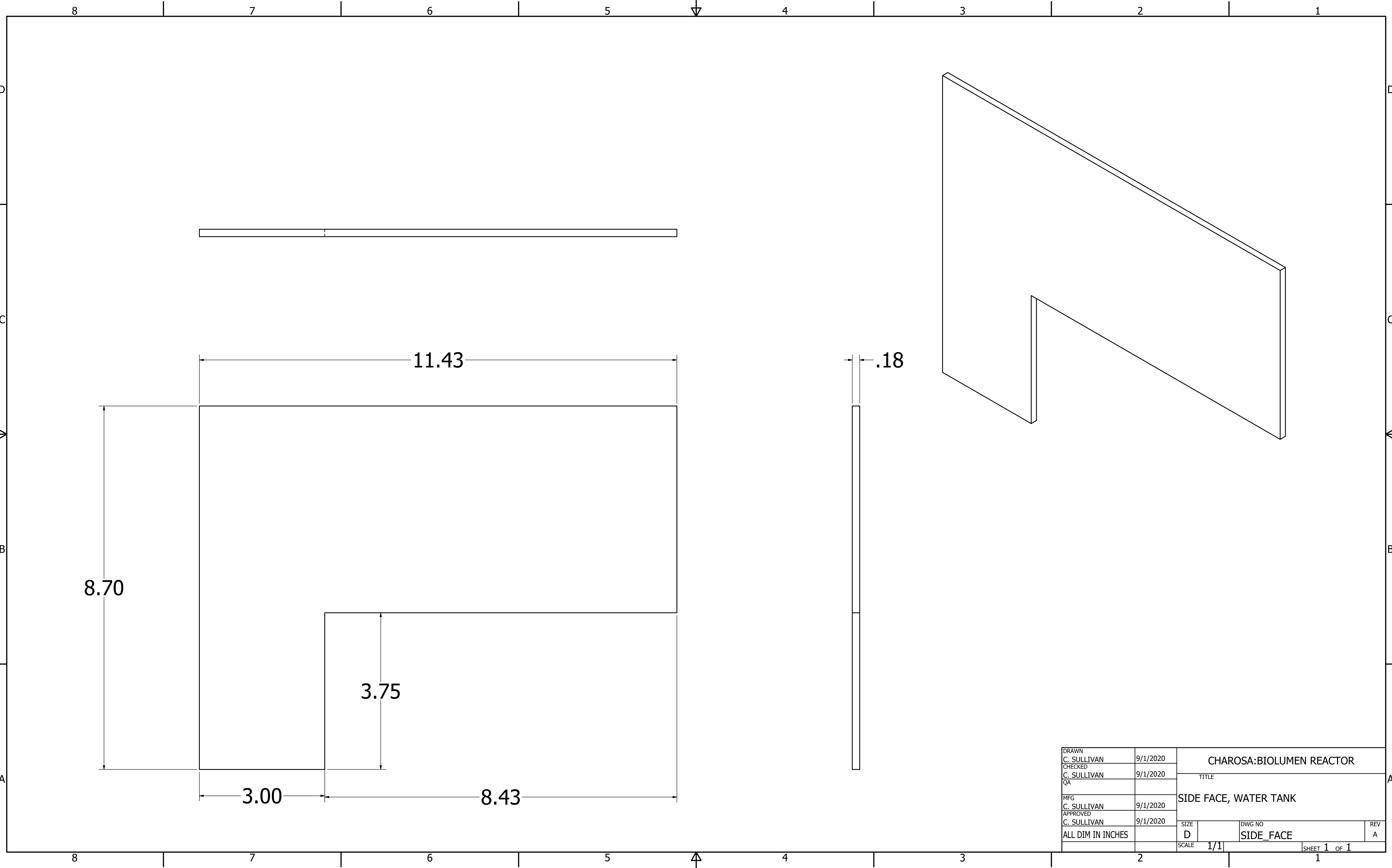


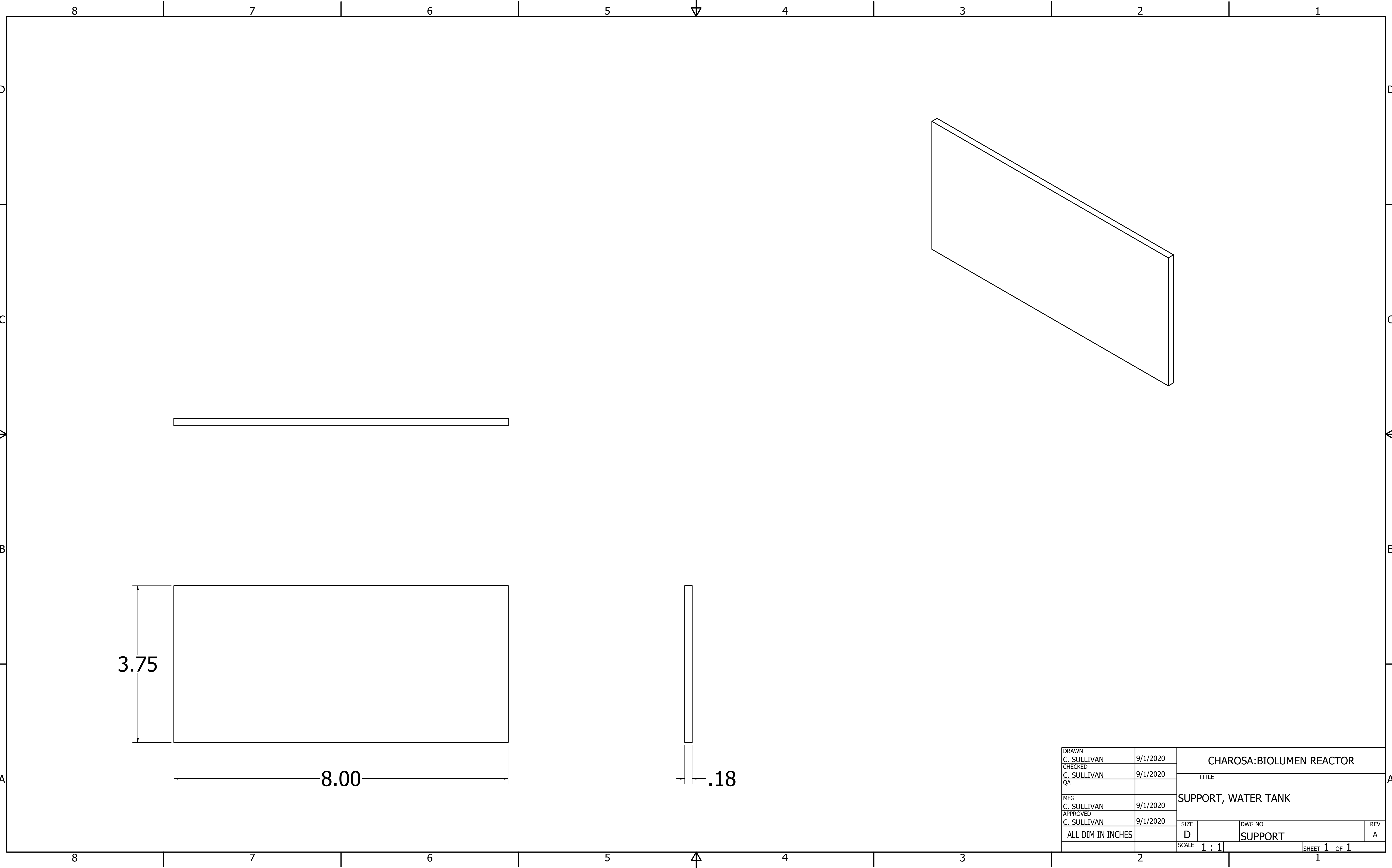
DRAWN C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR		
CHECKED C. SULLIVAN	9/1/2020	TITLE		
QA		GROUND BASE, WATER TANK		
MFG C. SULLIVAN	9/1/2020			
APPROVED C. SULLIVAN	9/1/2020	SIZE D	DWG NO GROUND_BASE	REV A
ALL DIM IN INCHES		SCALE 1 : 1	SHEET 1 OF 1	



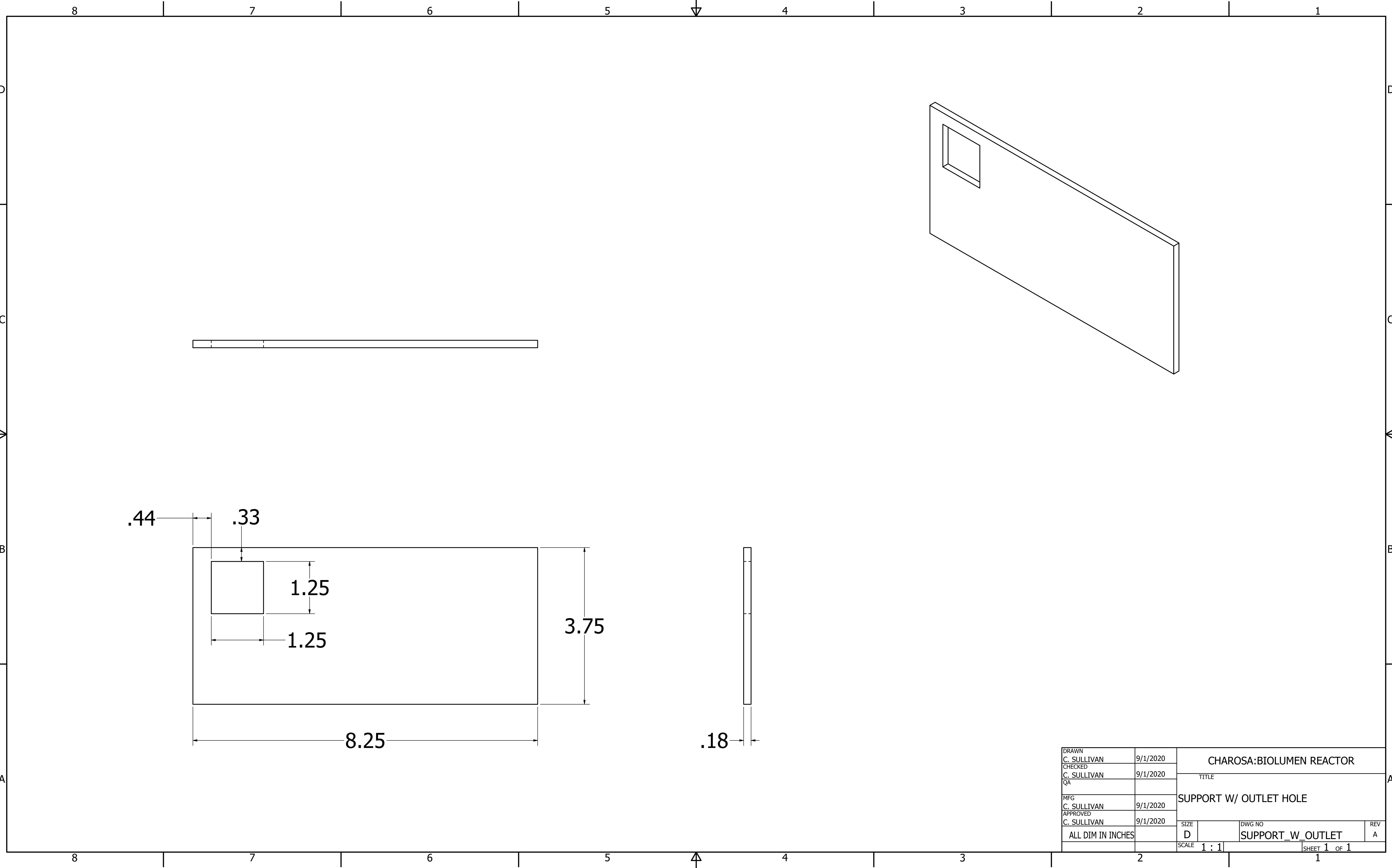


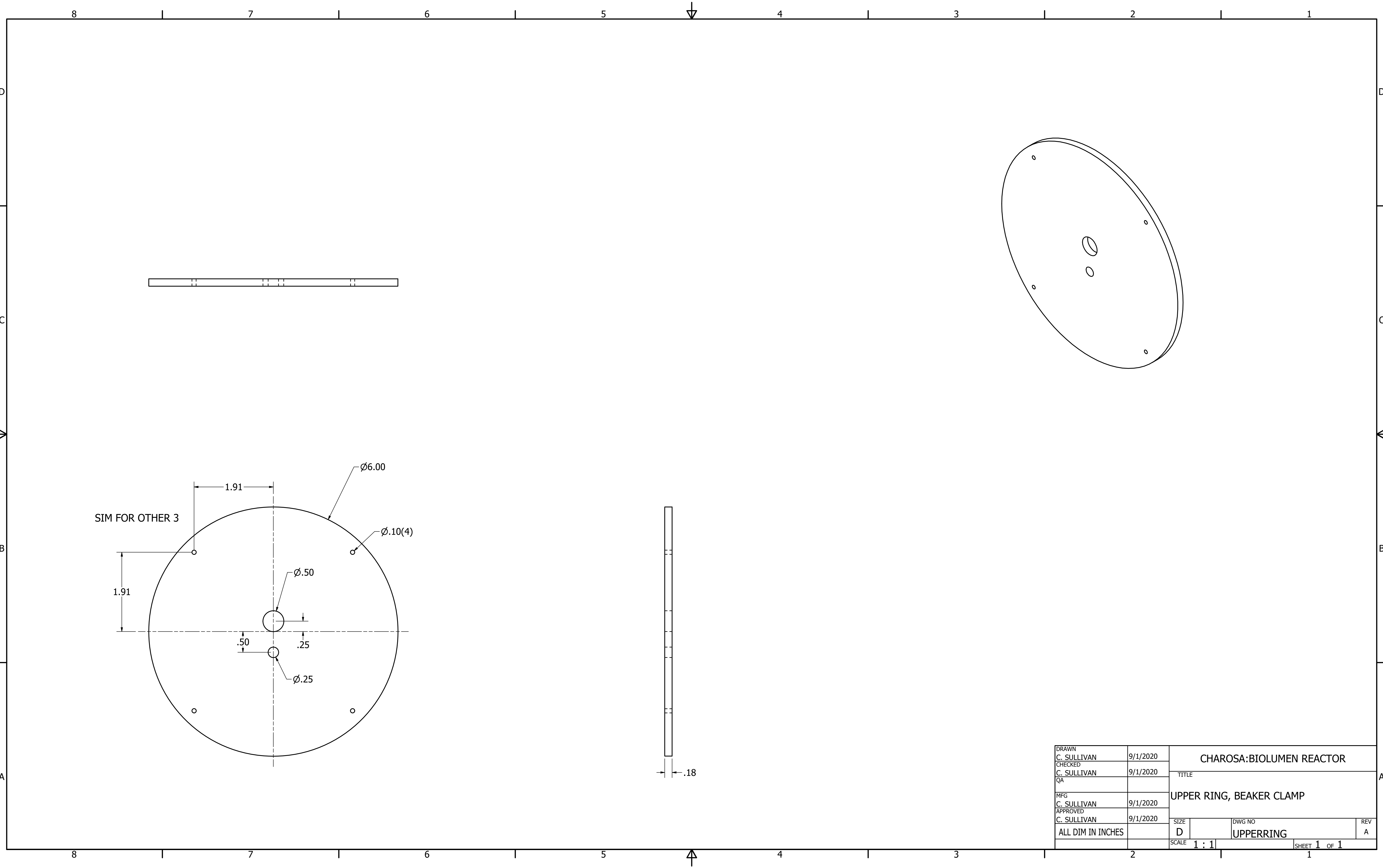
DRAWN	C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR		
CHECKED	C. SULLIVAN	9/1/2020	TITLE		
QA			BACK FACE, WATER TANK		
MFG	C. SULLIVAN	9/1/2020	DWG NO		
APPROVED	C. SULLIVAN	9/1/2020	REV		
ALL DIM IN CM			SIZE	D	BACK_FACE
			SCALE	1 : 1	SHEET 1 OF 1



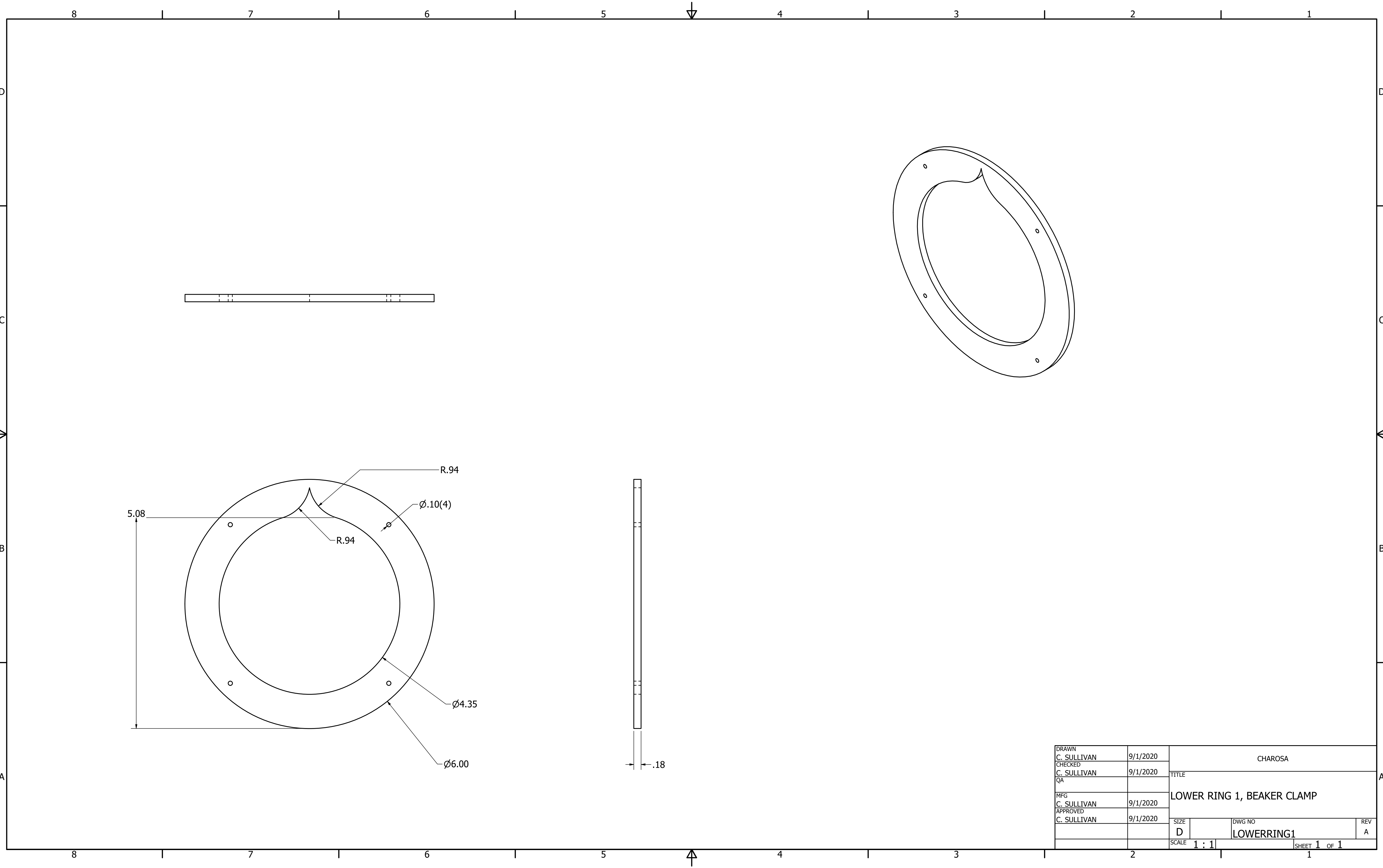


DRAWN	C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR		
CHECKED	C. SULLIVAN	9/1/2020	TITLE		
QA			SUPPORT, WATER TANK		
MFG	C. SULLIVAN	9/1/2020			
APPROVED	C. SULLIVAN	9/1/2020			
ALL DIM IN INCHES			SIZE	DWG NO	REV
			D	SUPPORT	A
		SCALE	1 : 1	SHEET 1 OF 1	

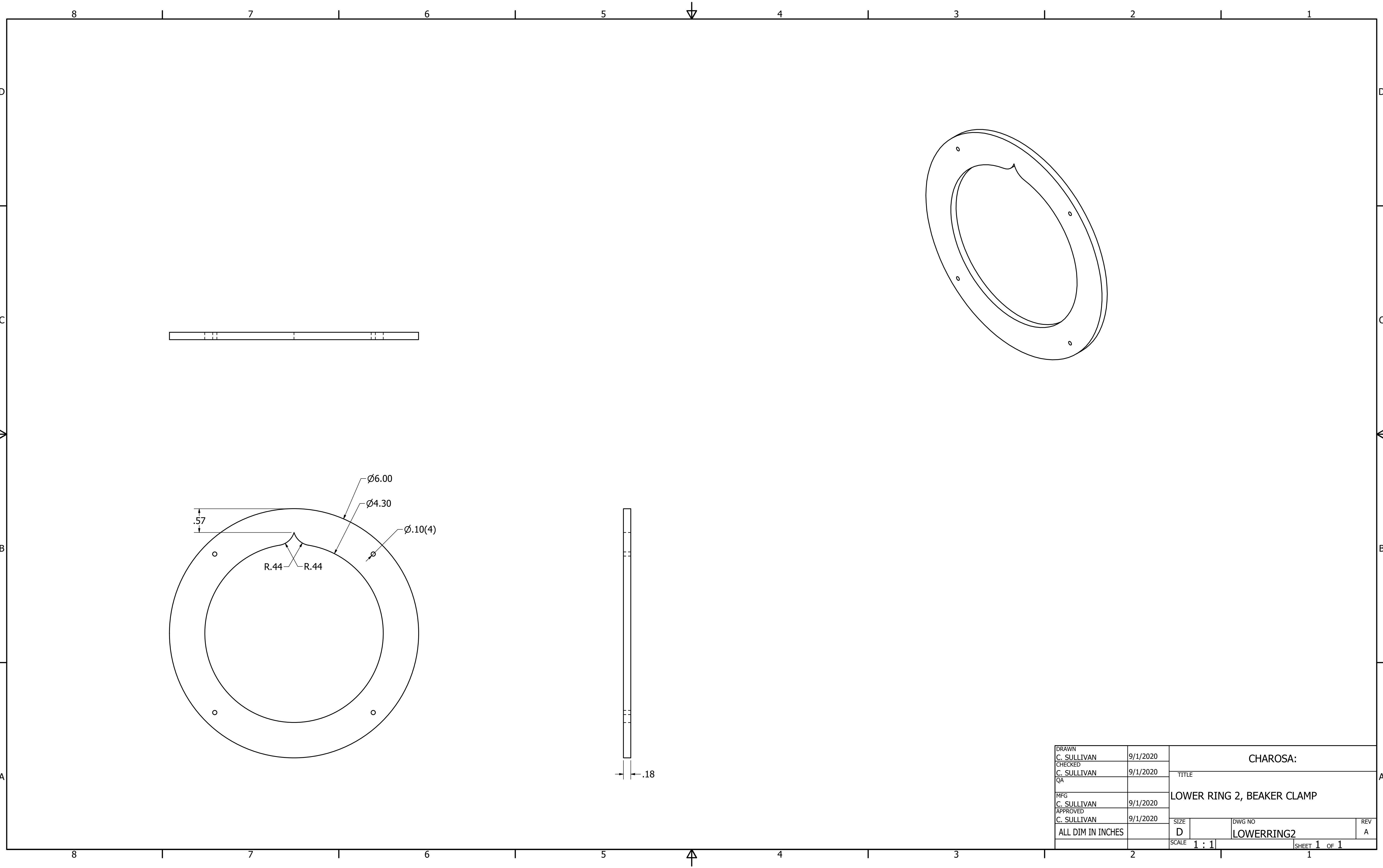




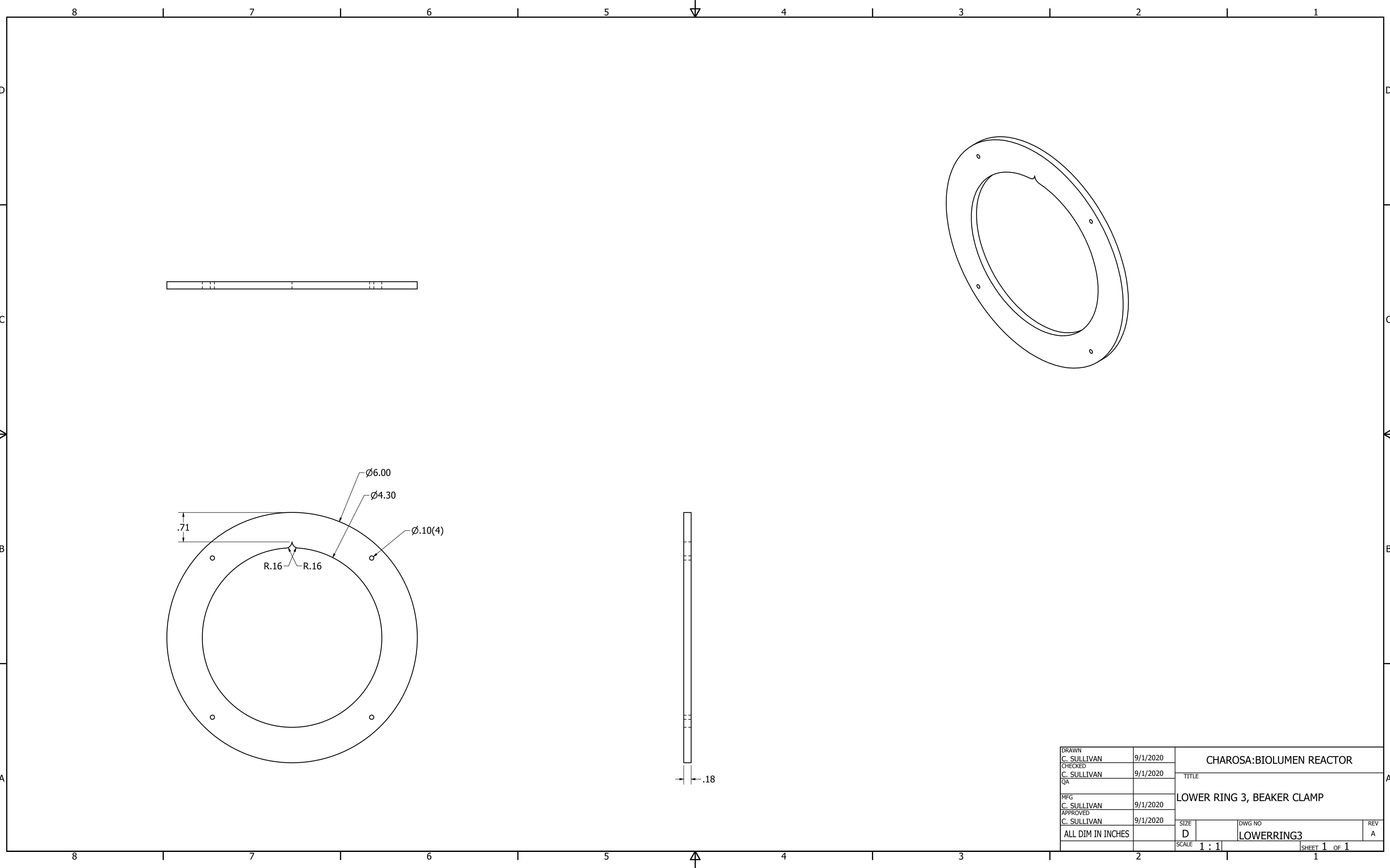
DRAWN C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR		
CHECKED C. SULLIVAN	9/1/2020	TITLE		
QA		UPPER RING, BEAKER CLAMP		
MFG C. SULLIVAN	9/1/2020	DWG NO		
APPROVED C. SULLIVAN	9/1/2020	UPPERRING		
ALL DIM IN INCHES		SIZE D	REV A	
		SCALE 1 : 1	SHEET 1 OF 1	



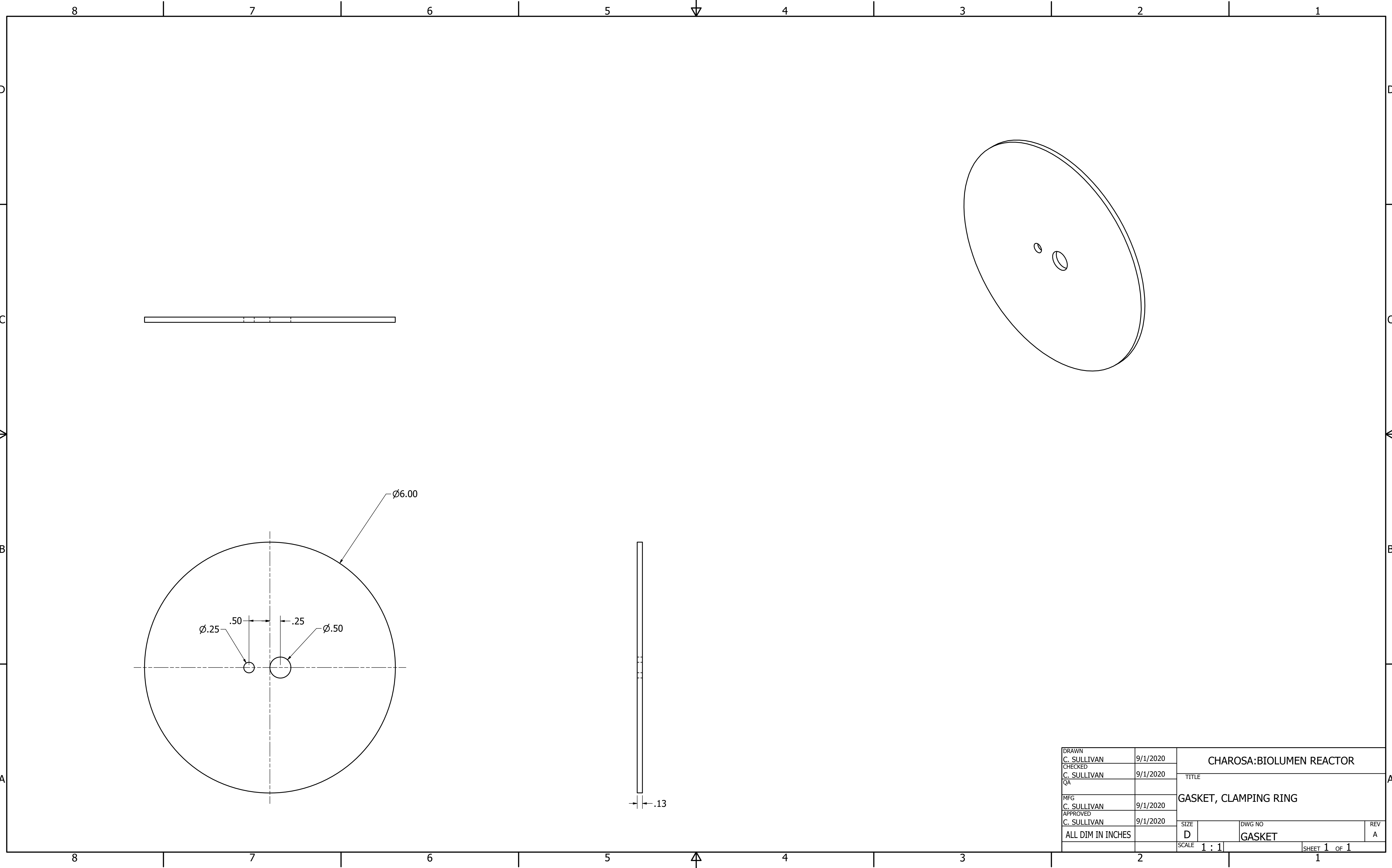
DRAWN C. SULLIVAN	9/1/2020	CHAROSA		
CHECKED C. SULLIVAN	9/1/2020	TITLE		
QA		LOWER RING 1, BEAKER CLAMP		
MFG C. SULLIVAN	9/1/2020	DWG NO		
APPROVED C. SULLIVAN	9/1/2020	LOWERRING1		
		SIZE D	REV A	
		SCALE 1 : 1	SHEET 1 OF 1	

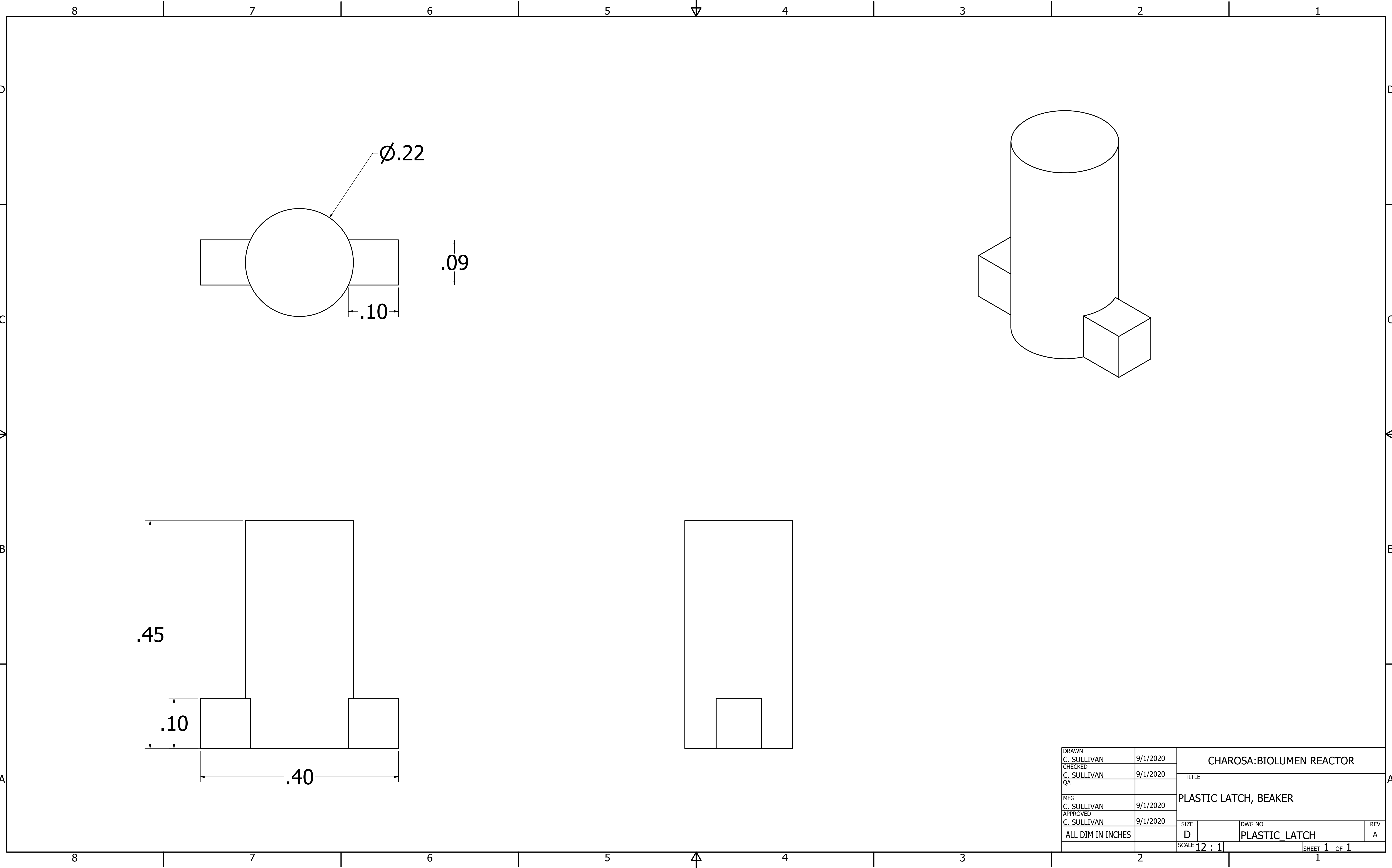


DRAWN C. SULLIVAN	9/1/2020	CHAROSA:		
CHECKED C. SULLIVAN	9/1/2020			
QA		TITLE LOWER RING 2, BEAKER CLAMP		
MFG C. SULLIVAN	9/1/2020			
APPROVED C. SULLIVAN	9/1/2020	SIZE D	DWG NO LOWERRING2	REV A
ALL DIM IN INCHES		SCALE 1 : 1	SHEET 1 OF 1	



DRAWN C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR		
CHECKED C. SULLIVAN	9/1/2020	TITLE		
QA		LOWER RING 3, BEAKER CLAMP		
MFG C. SULLIVAN	9/1/2020	DWG NO		
APPROVED C. SULLIVAN	9/1/2020	LOWERRING3		
ALL DIM IN INCHES		SCALE	1 : 1	SHEET 1 OF 1





DRAWN C. SULLIVAN	9/1/2020	CHAROSA:BIOLUMEN REACTOR		
CHECKED C. SULLIVAN	9/1/2020	TITLE		
QA		PLASTIC LATCH, BEAKER		
MFG C. SULLIVAN	9/1/2020			
APPROVED C. SULLIVAN	9/1/2020	SIZE D	DWG NO PLASTIC_LATCH	REV A
ALL DIM IN INCHES		SCALE 12 : 1	SHEET 1 OF 1	