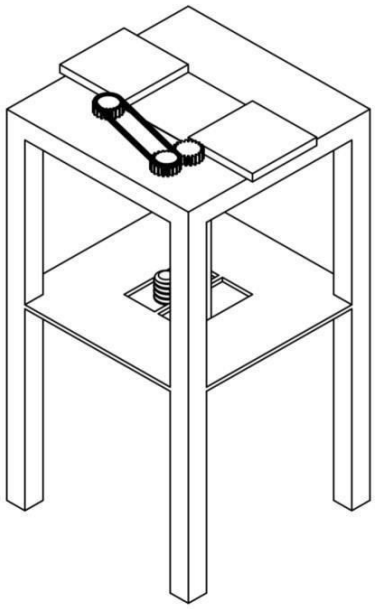
TA212A - MANUFACTURING PROCESS II

Group Number 4

Safe Link System



Team Members	Roll No.
Aryan Gautam	220222
Ashutosh Kumar	220241
Chayank Garg	220311
Chandrabhan Ahirwar	220305
B Anirudh	220298
Ayush Pratap Singh	220270

Project Guide: Mr. Rabindranath Tudu **Instructor:** Dr. Niraj Sinha

Contents

Introduction

The SafeLink Gate System aims to provide enhanced security and convenience by implementing a sophisticated gate mechanism equipped with advanced sensors and notification capabilities. The project revolves around the creation of a gate system that seamlessly coordinates the opening and closing of barriers. The system is designed to detect the presence of individuals approaching anonymously and instantly notify the user via their smartphone.

Project Description

The SafeLink Gate System comprises a meticulously engineered setup featuring gear mechanisms and infrared (IR) sensors to ensure precise coordination between the barriers. When an anonymous individual approaches the gate, the IR sensor detects their presence and triggers a series of actions. Firstly, the barriers close simultaneously to restrict unauthorized access. Concurrently, the SafeLink will send notification.

Key Features

Seamless Coordination: The gate system ensures synchronized movements of the split bridge and barriers, maintaining security while facilitating smooth passage.

IR Sensor Detection: An infrared sensor detects the presence of individuals approaching the gate, enabling proactive security measures.

Instant Notifications: Upon detecting anonymous entry, the system promptly sends notifications to the user's smartphone, providing real-time alerts about unauthorized access attempts.

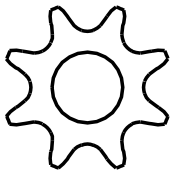
Enhanced Security: By swiftly responding to potential security breaches, the SafeLink Gate System helps fortify the premises against unauthorized entry.

Motivation

In an era of heightened security concerns, the SafeLink Gate System offers a transformative solution. By seamlessly integrating advanced technology and real-time notifications, it empowers users with unparalleled control and efficiency. With its innovative approach and commitment to peace of mind, the SafeLink Gate System redefines security for a safer, more connected world.

Materials list

Part no.	Part name	Dimensions	Materials required	Machine process	Quantity	Page no.
1	Roller chain	Standard	-	-	1	
2	Sprocket		Mild steel	Milling	1	
3	Worm gear		Mild steel	Milling	2	
4	Worm		Mild Steel	Milling	2	
5	Rack		Mild steel	Milling	3	
6	Spur gear		Mild steel	Milling	3	
7	Base plate		Mild Steel	Cutting	1	
8	Table		Mild Steel	Cutting	1	
9	Legs		Mild Steel	Cutting	1	
10	Gate		Mild Steel	Cutting	2	
11	Arduino with Sensor	Standard	-	-	2	
12	Motor (1N/ 2N)	Standard	-	-	2	

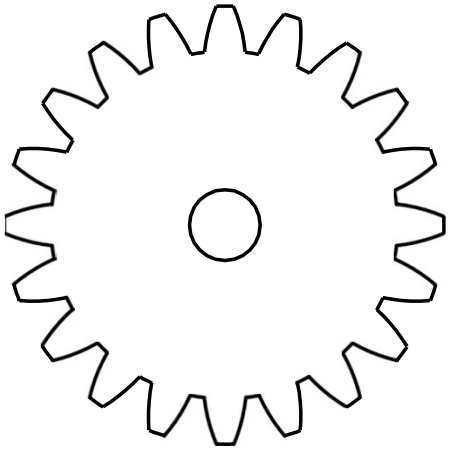


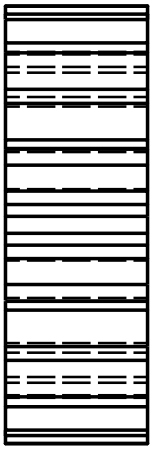
Calculations

Quantity	2
No. of teeth (N)	8
Module(M)	1.5
PCD	32.31mm
Roller Diameter	8mm
Outer Diameter	PCD + Roller Diameter = 40.34mm
Root Diameter	PCD - Roller Diameter = 24.34mm
Rod Diameter	12.7mm
Depth of cut	8
Indexing Calculation	40/N = 40/8 = 5

Designed by	Checked by	Approved by	Date	Date	
-				12-02-2024	

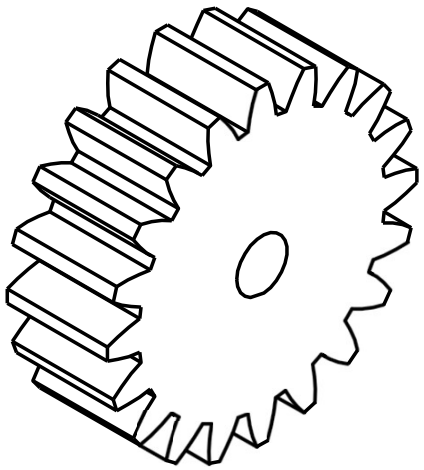
Roller chain sprocket	Edition	Sheet
		1 / 1





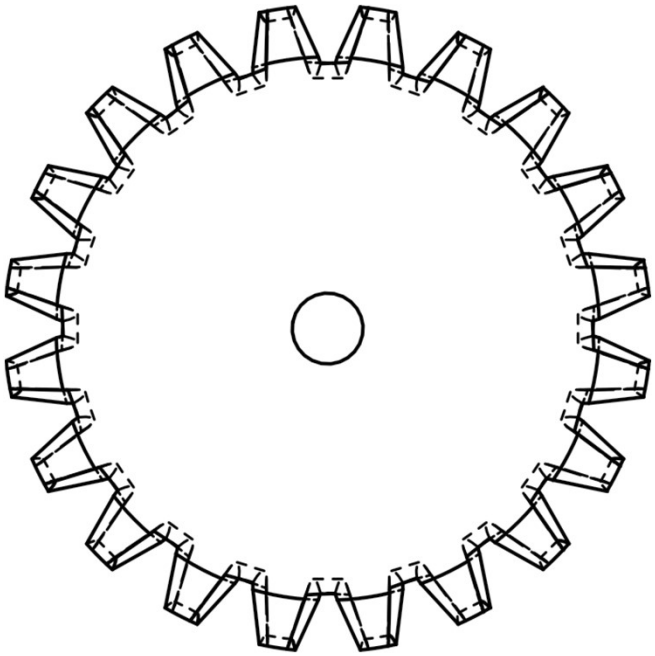
Calculations

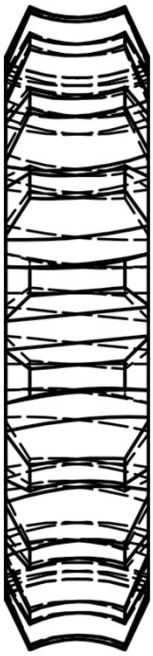
Quantity	3
No. of teeth	20
Module	1.5
Addendum	= module = 1.5
Dedendum	33
Pitch Circle Diameter (PCD)	30
Tooth Depth	3.23
Linear pitch	3.14*M = 62.8
Face Width	10mm
Indexing	40/N=40/20 = 2

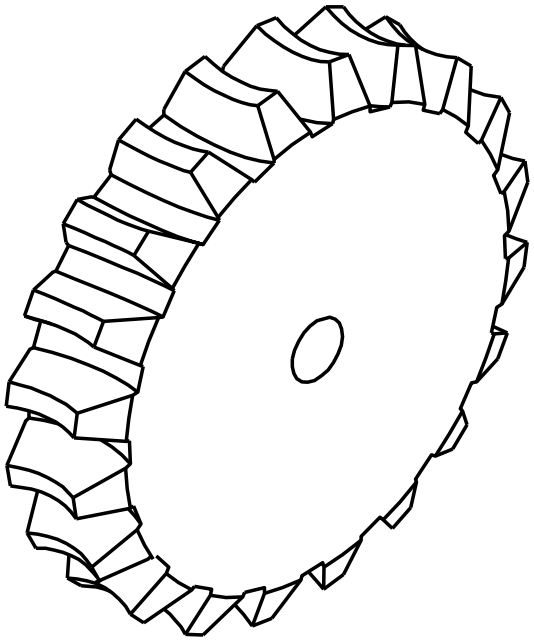


Designed by	Checked by	Approved by	Date	Date	
-				12-02-2024	

Spur Gear		Edition	Sheet 1 / 1

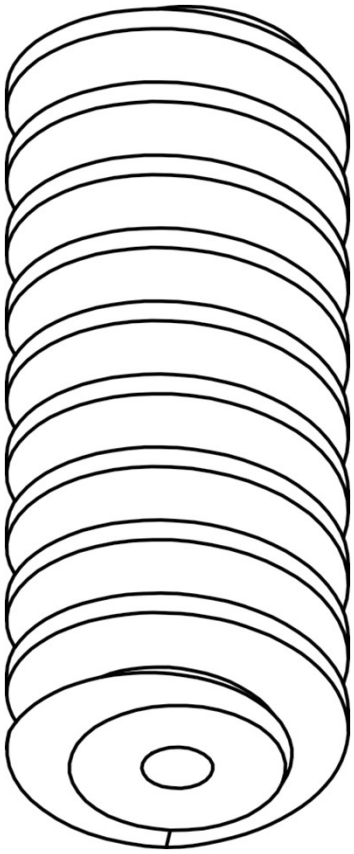


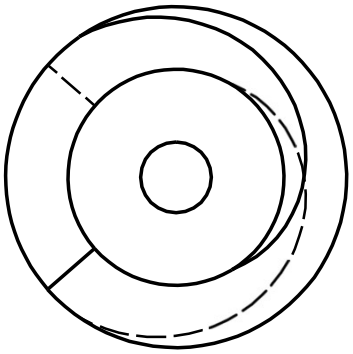


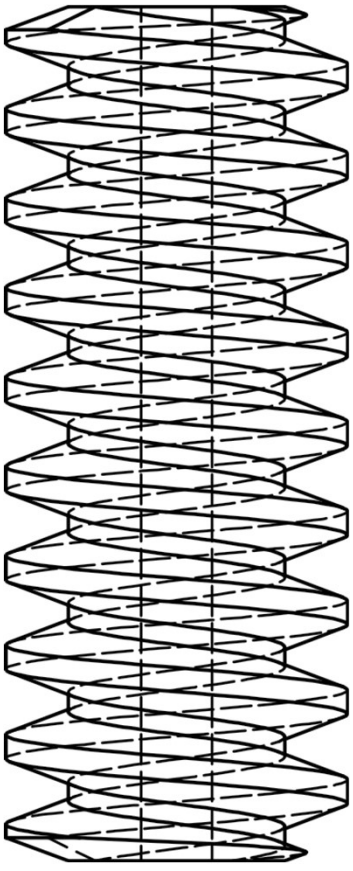


Designed by	Checked by	Approved by	Date	Date	
-				12-02-2024	

Worm Gear		Edition	Sheet 1 / 1





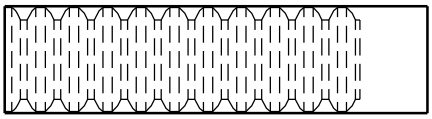


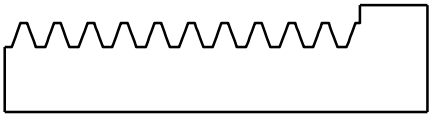
Designed by	Checked by	Approved by	Date	Date	
-				12-02-2024	

Worm		Edition	Sheet 1 / 1

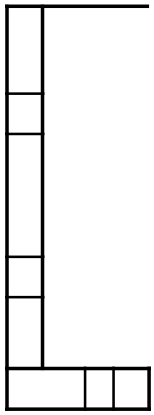
Calculation of Worm and Worm Wheel

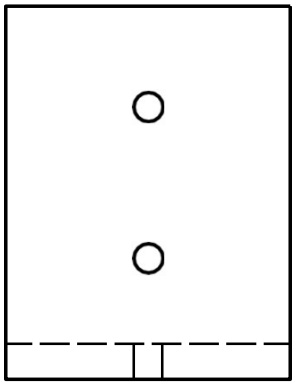
Item	Worm **Example**	Wheel
Normal Module	1.5	
Pressure Angle	20 degrees	
No. of threads, no. of teeth	3	30(R)
Pitch Diameter of Worm	44	
Lead angle (gashing angle)	5.87	
Pitch Diameter of Worm Gear	-	95.24
Center Distance	44.40	
Addendum	1.5	1.28
Whole Depth	3.375	
Outside Diameter	47	99.32
Throat Diameter	-	97.82
Throat Surface Radius	-	20.5
Root Diameter	40.25	91.07

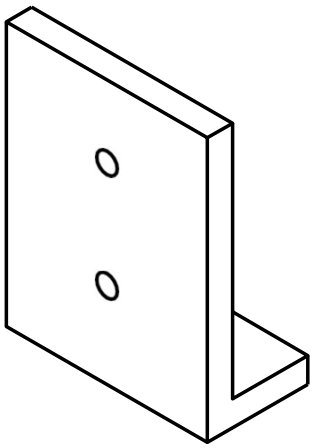




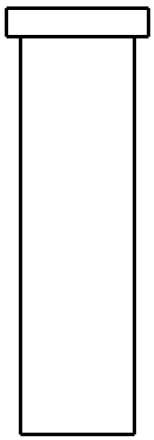
Dept.	Technical reference	Created on	Approved by		
		12-02-2024			
		Document type	Document status		
		Title	DWG No.		
		rack pin			
			Rev.	Date of issue	Sheet
					1/1

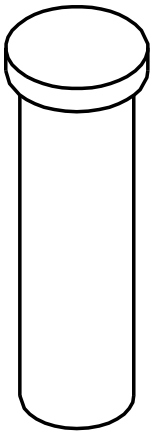


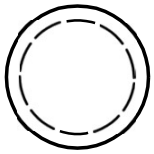




Designed by	Checked by	Approved by	Date	Date	
-				12-02-2024	
		L clamp		Edition	Sheet 1 / 1

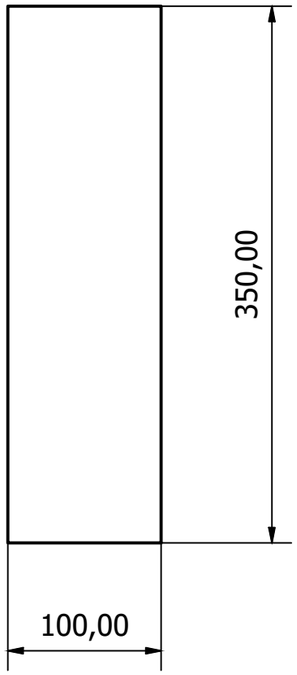


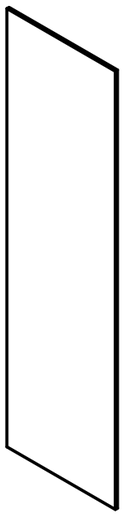




Designed by	Checked by	Approved by	Date	Date	
-				12-02-2024	

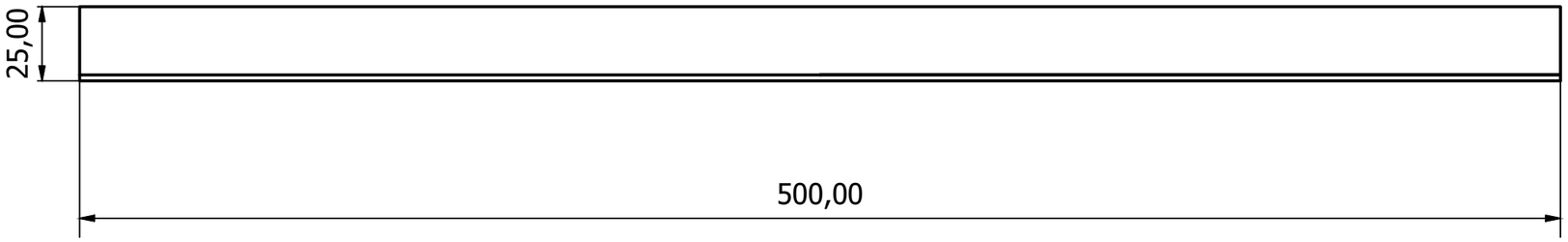
shaft		Edition	Sheet 1 / 1

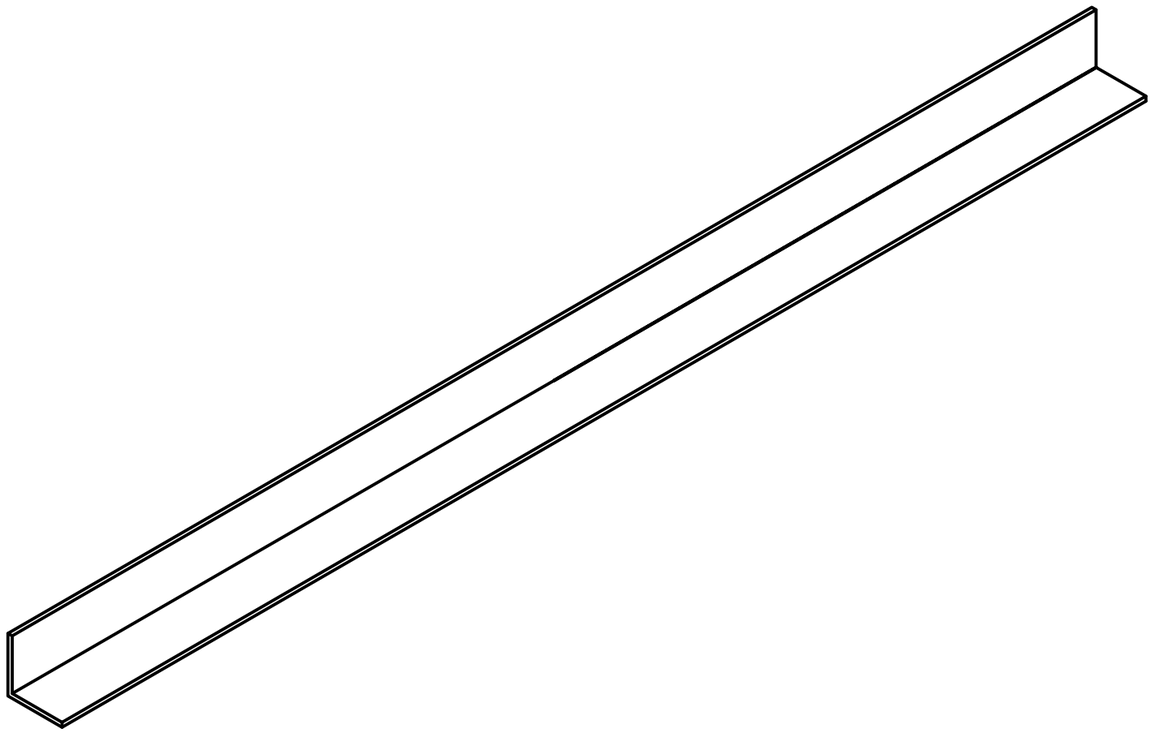




Designed by	Checked by	Approved by	Date		Date	
91636					16-04-2024	

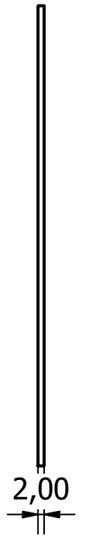
Fixed plate x2		Edition	Sheet 1 / 1

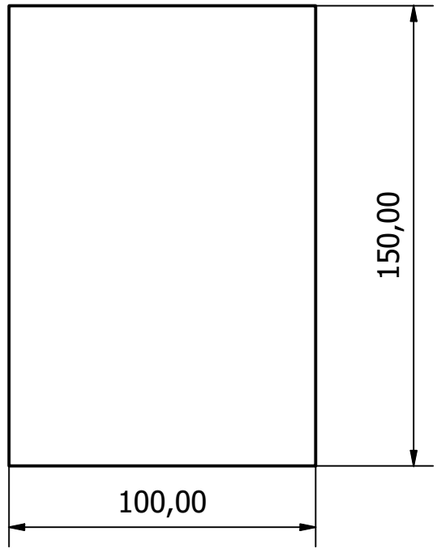


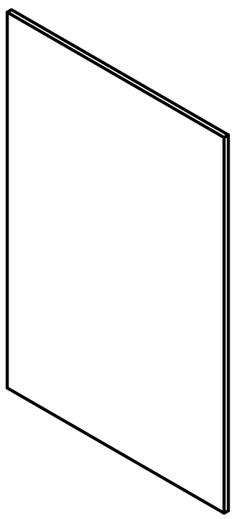


Designed by	Checked by	Approved by	Date		Date	
91636					16-04-2024	

		Edition	Sheet
Leg x4			1 / 1

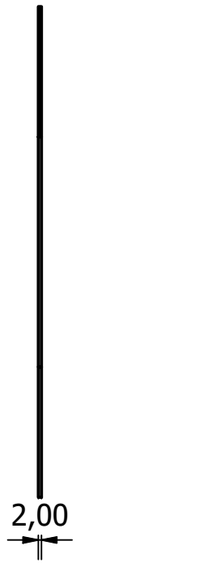


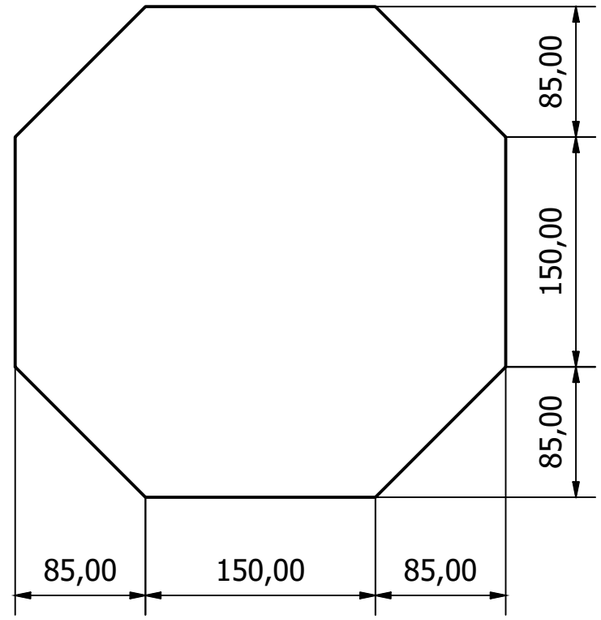


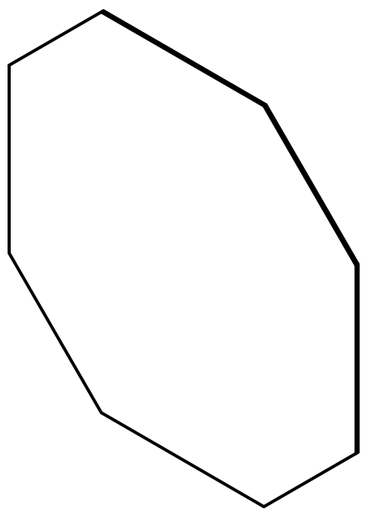


Designed by	Checked by	Approved by	Date		Date	
91636					16-04-2024	

Moving plate x2		Edition	Sheet 1 / 1

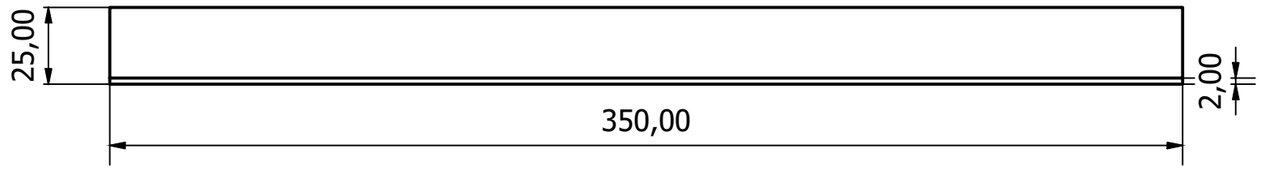


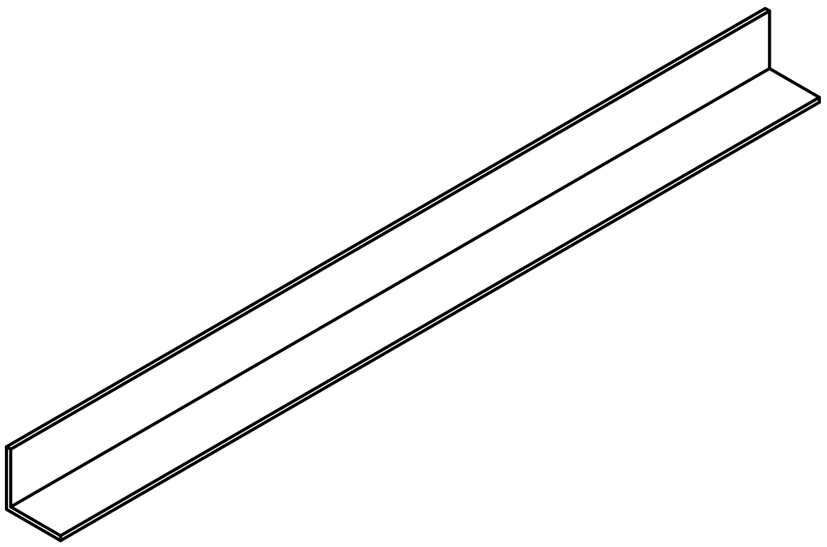




Designed by	Checked by	Approved by	Date		Date	
91636					16-04-2024	

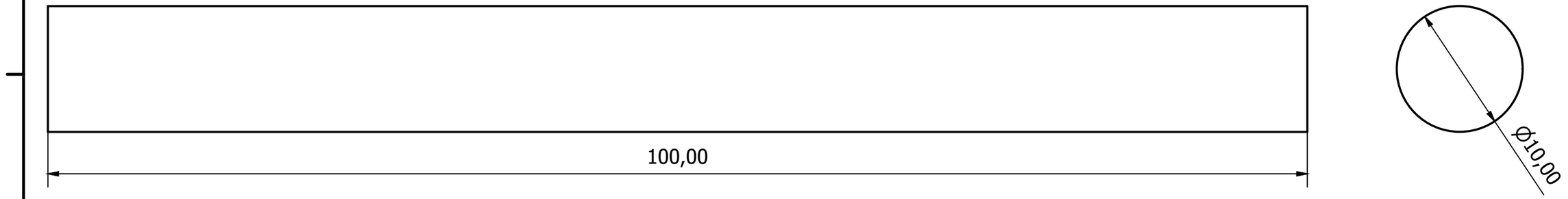
Octagon plate		Edition	Sheet 1 / 1

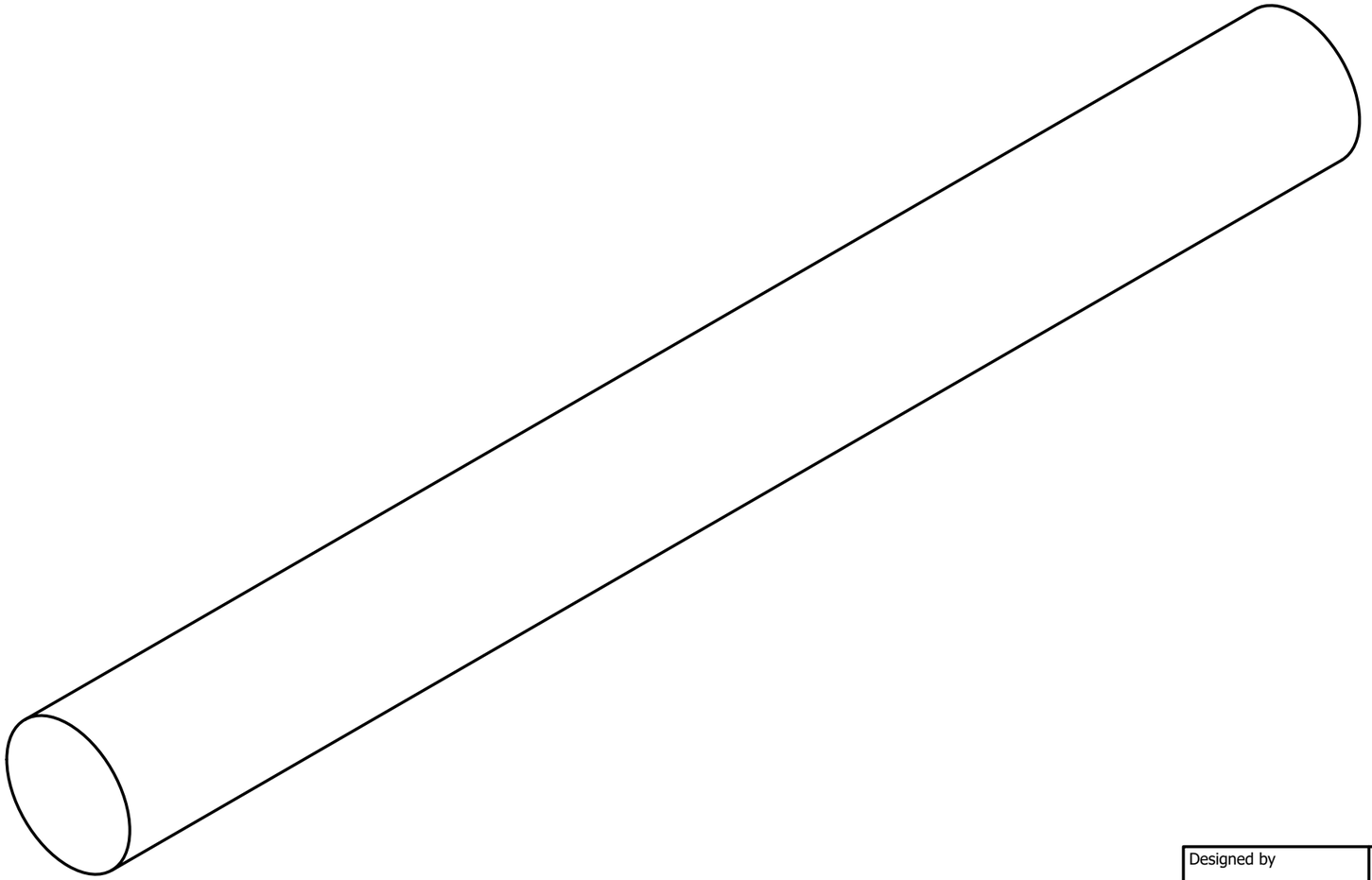




Designed by	Checked by	Approved by	Date		Date	
91636					16-04-2024	

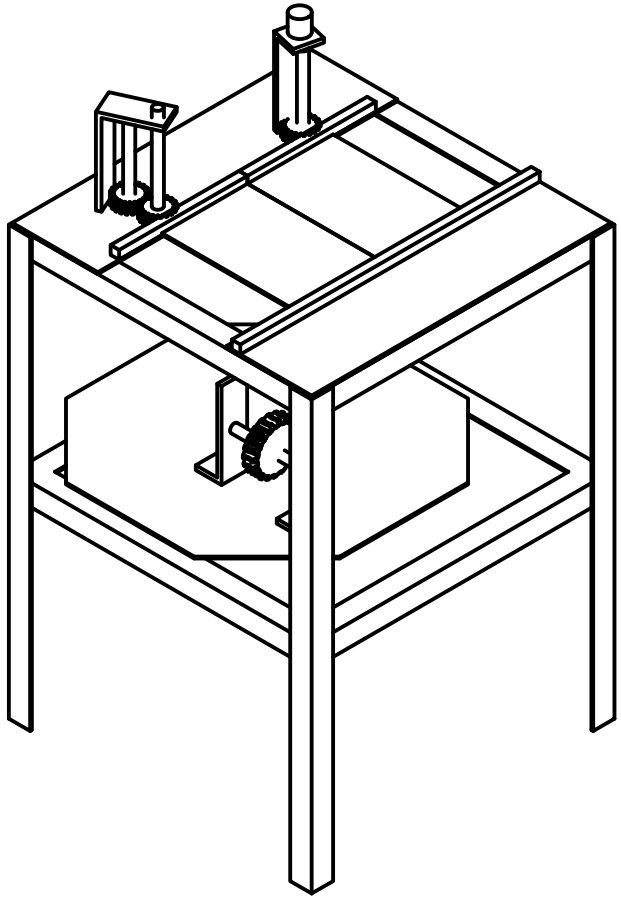
	Part1 x8	Edition	Sheet 1 / 1





Designed by	Checked by	Approved by	Date		Date	
91636					16-04-2024	

		Edition	Sheet
Rod x4			1 / 1



Designed by	Checked by	Approved by	Date		Date	
91636					16-04-2024	

	Final	Edition	Sheet 1 / 1