TA201P - Introduction to Manufacturing Process - I (Practical)

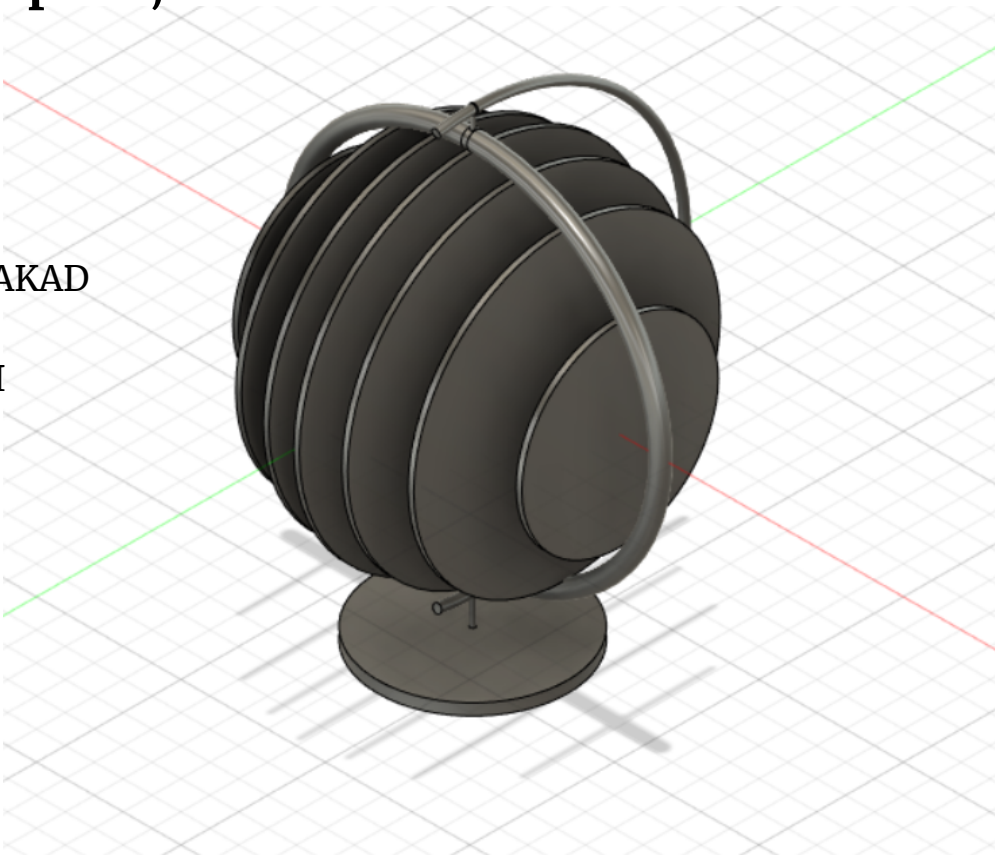
(2020-2021, Summer Semester)

Instructor : Dr. Anish Upadhyay

Section Incharge: Dr. Amrendra Singh

Project B Report

Group - 8, Section - 6



Group Members:

190635 PRATEEK PANDEY
190637 PRATHMESH SINGH DHAKAD
190653 PROTYAYDEEP SHEE
190656 PUSHPANSHU TRIPATHI
190678 RAJAT SINGH
190680 RAJEEV RANJAN
190692 REETIKA TAYAL
190695 RIDHUL SAMBOD
190707 RISHI VERMA
190716 ROHAN PRATAP SINGH

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Introduction

A Globe is a spherical structure on which a map of the world can be represented. Instead of directly using a spherical object, we have used seven circular plates of different diameters to give a spherical look to our globe.
The globe has a circular holding rod to hold all the plates in positions. A base plate supports the entire globe. The holding rod is welded to the base of the model. Apart from this, we also make use of a small cylinder of diameter equal to the diameter of the centre plate, to which the plates are welding.
The manufacturing processes we used for making the globe include rolling (for making plates), welding(for making joints) and sand casting(for making the hollow cylinder).

Motivation

When the prospect of creating a project came up, we wanted to create something that can be used in our day to day life. We explored the internet and had an exchange of ideas amongst ourselves in search of a perfect project concept. Initially we had come up with numerous ideas, but after multiple discussions amongst our group members and section tutor, we decided to go forth with the idea of creating a globe after considering it's relevance in our everyday life and its usefulness for people of all age groups.

Thus, it was finally decided to make a globe as our TA201 project. It is an opportunity for us to learn about the various manufacturing processes and apply them into a real-life application project.

Acknowledgement

We would like to express our sincere gratitude to our tutor Prof. Amrendra Singh and our lab-in-charge Mr. Anil Kumar Verma for their support and instruction in this project.Their support and direction was instrumental throughout the execution of the project.
We would also like to thank Prof. Anish Upadhyay, our course instructor for TA201P, for providing us with this opportunity to explore our creativity and create something of our own through the lab manufacturing processes even in online mode.
We would also like to thank our TAs Yugesh Kumar and Gulnaaz Parween for their valuable time.
Last but not the least, we would also like to extend our deepest gratitude to all the lab staff -Mr IP Singh, Mr Gaurav Mishra who played an important role to help us to achieve our goal. Their videos from the TA201 lab were very helpful in acquiring various skills necessary to complete the project.

Work Distribution

	Week 1	Week 2	Week 3	Week 4	Week 5
190635 PRATEEK PANDEY	Discussing Ideas	Made documentation for ideas(Merry Go round)	Part-B Report Making	Part-B Report Making	Part-B Report Making (Engineering Drawings allotment)
190637 PRATHMESH SINGH DHAKAD	Discussing Ideas	Made documentation for ideas (Turbine)	Part-B CAD Model Modelling and started making isometric of parts	Part-B CAD Model Analysed model and made isometric drawing	Part-B Report Making(model and isometric submission)
190653 PROTYAYDEEP SHEE	Discussing Ideas	Made documentation for ideas (Merry Go round)	Part-A Report Making	Part-A CAD Model Making (hand)	Part-A Report Making
190656 PUSHPANSHU TRIPATHI	Discussing Ideas	Made documentation for ideas (Globe)	Part-B Report Making (Initiallised doc and started work on CAD)	Part-B CAD Model Making (Disc)	Part-B Report Making (Engineering Drawings allotment)
190678 RAJAT SINGH	Discussing Ideas	Made documentation for ideas (Globe)	Part-B Report Making	Part-B Report Making	Part-B Report Making (Formatting and introduction)
190680 RAJEEV RANJAN	Discussing Ideas	Made documentation for ideas(Turbine)	Part-A Report Making	Part-A CAD Model Making	Part-A Report Making
190692 REETIKA TAYAL	Discussing Ideas	Made documentation for ideas (Merry Go round)	Part-B Report Making	Part-B Report Making	Part-B Report Making (Material Used and cost)
190695 RIDHUL SAMBOD	Discussing Ideas	Made documentation for ideas (Merry Go round	Part-B CAD Model Making (Cylinder)	Part-B CAD Model Making (Cylinder and assembling)	Part-B Report Making
190707 RISHI VERMA	Discussing Ideas	Made documentation for ideas (Turbine)	Part-A Report Making	Part-A CAD Model Making	Part-A Report Making
190716 ROHAN PRATAP SINGH	Discussing Ideas	Made documentation for ideas (Turbine)	Part-A Report Making	Part-A CAD Model Making (Head)	Part-A Report Making

Material List

Sr. NO.	Name of Part	Material	Quantity	Size	Cost	Process Involved
1	Type 1 outermost plate	GI Steel	2	Thickness=5mm Diameter=135.9mm	2*Rs.41(Rs.60/kg)	Sheet metal cutting, rolling
2	Type 2 inner plate	GI Steel	2	Thickness=5mm Diameter=211.8mm	2*Rs.88	Sheet metal cutting, rolling
3	Type 3 inner plate	GI Steel	2	Thickness=5mm Diameter=231.6 mm	2*Rs.105	Sheet metal cutting, rolling
4	Type 4 middle plate	GI Steel	1	Thickness=5mm Diameter=243.8mm	Rs.114	Sheet metal cutting, rolling
5	Outer hold cylinder	GI steel flat	1	Inner radius=243.8mm Outer radius=254.8mm	Rs.10	Sand Casting, Cutting
6	Axis	Mild Steel Rod round	1	Radius=3 mm, Length=295.6 mm	Rs.10	Cutting and rolling
7	Half cylinder	GI steel flat	1	Thickness=5.7 mm Length=285.5 mm	Rs.200	Sand Casting, Cutting, welding
8	Base	Mild steel sheet	1	Thickness= 2mm Diameter = 130.1mm	Rs.40(Rs59/kg)	Cutting and rolling

Total Cost Estimated: Rs 842/-

Details of Processes Involved

- Sheet Metal Cutting:

  In this process, the metal sheet is divided into parts by applying shear forces large enough by edges of the punch and dies to cause the metal to fail. The term for the process is “Pressworking”. It involves working of the sheet between two dies, the upper die is called a punch which presses the sheet against a fixed lower die.

- Rolling:

  Rolling is a metal forming process in which metal stock is passed through one or more pairs of rolls to reduce the thickness, to make the thickness uniform, and/or to impart a desired mechanical property. We used cold rolling to change the thickness of the sheet and make it uniform.

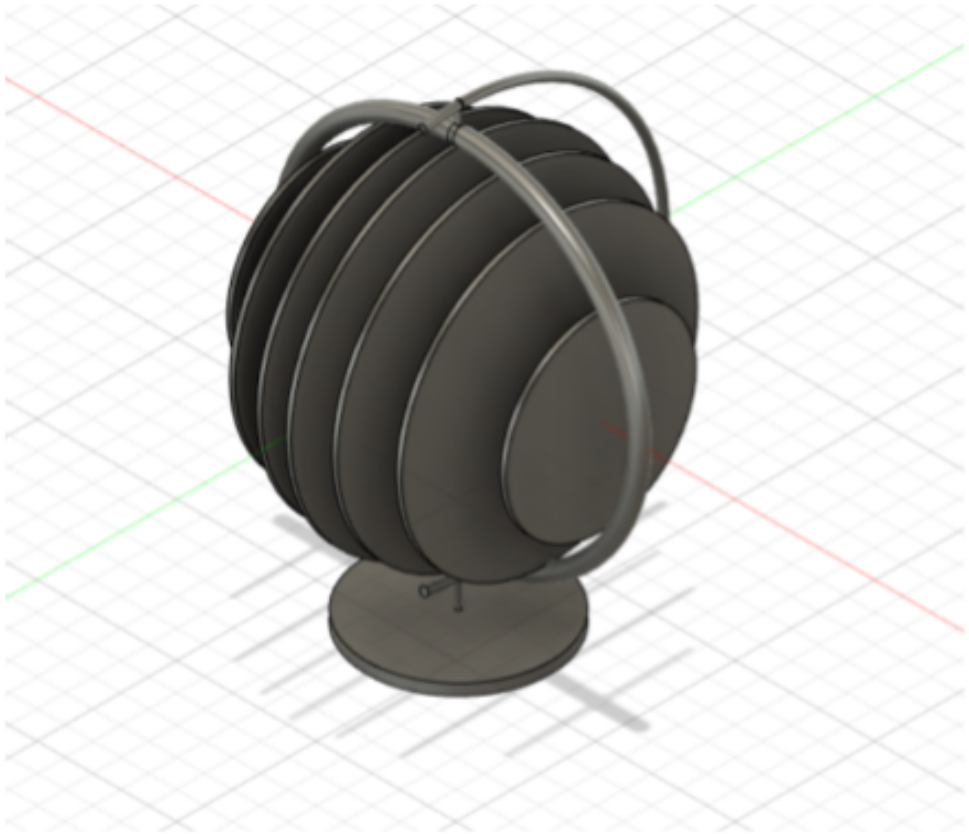
- Welding:

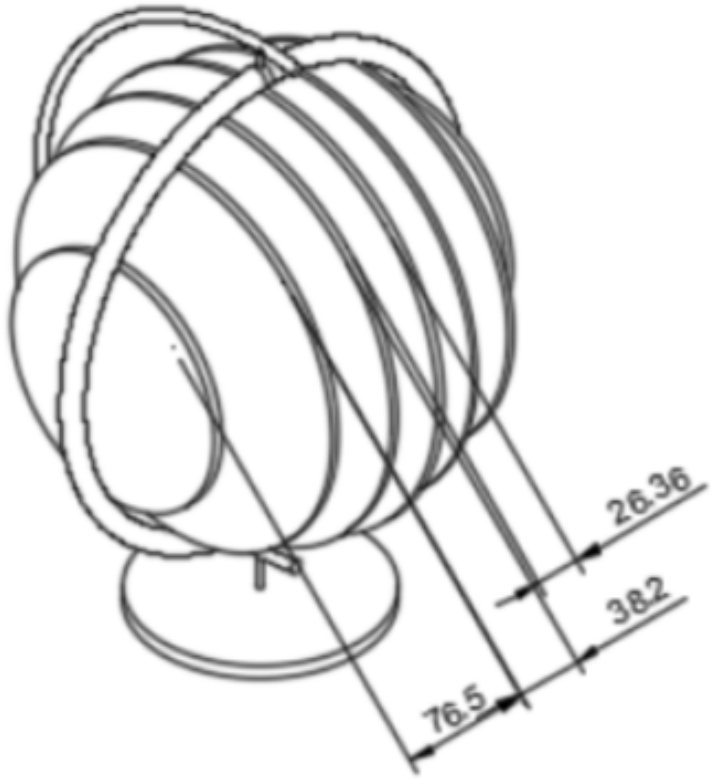
  Welding is a fabrication process that joins materials, usually metals or thermoplastics, by using high heat to melt the parts together and allowing them to cool, causing fusion. A filler material is added to the joint to form a pool of metal that solidifies to give strength to the weld.

- **Sand Casting:**

  It is a metal casting process characterized by using sand as the mold material.In addition to the sand, suitable bonding agent (usually clay) is mixed or occurs with the sand. The mixture is moistened to develop the strength and plasticity of the clay and to make the aggregate suitable for molding.

Engineering Drawings





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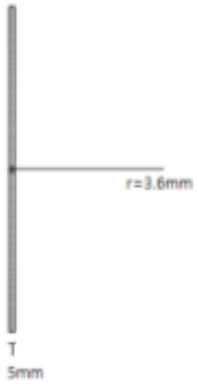
User						

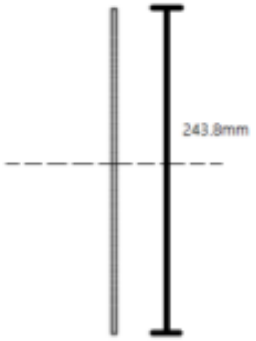
Isometric

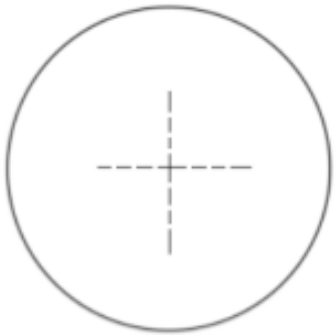
Section 6, Group 8

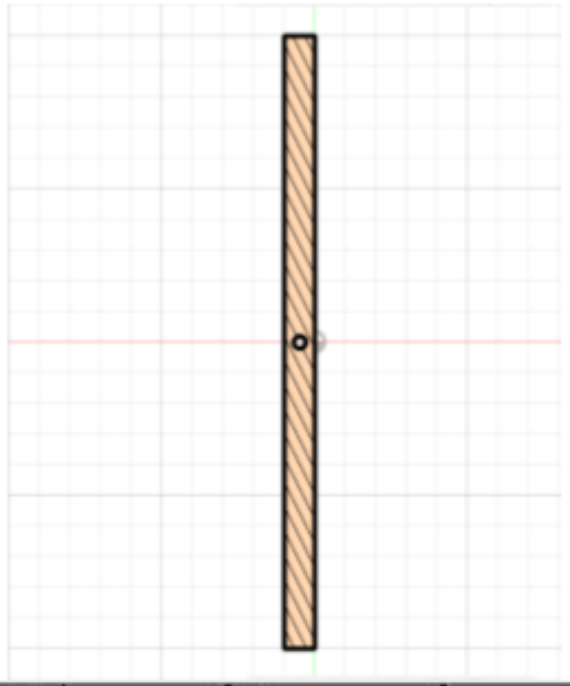
Sheet	Edition	Sheet
1 / 1		1 / 1

Name: Middle Disc
Material Used: GI Steel(Green)
Processing:Sheet Metal Cutting and Rolling









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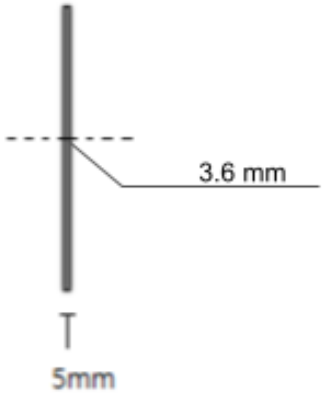
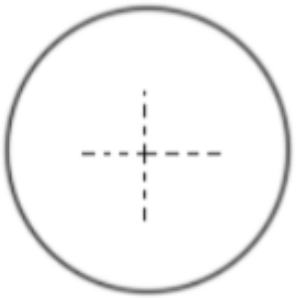
Orthographic and sectional

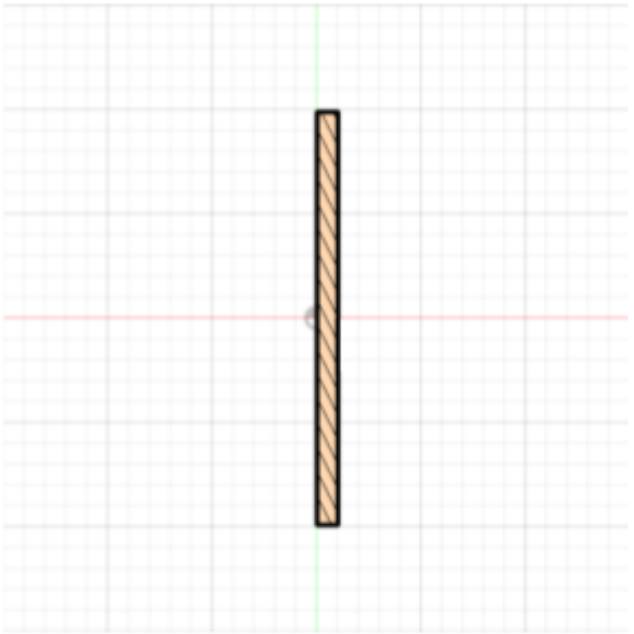
Section 6, Group 8

Sheet	Edition	Sheet
1 / 1		1 / 1

Name: Middle Right of Middle Disc
Material Used: GI Steel(Green)
Processing: Sheet Metal Cutting and Rolling







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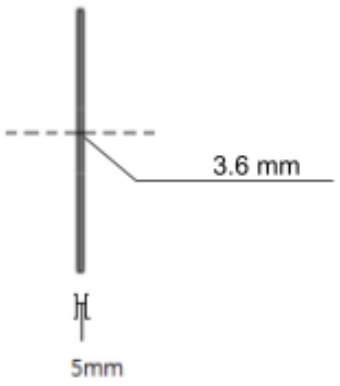
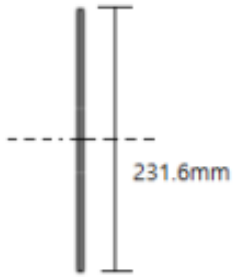
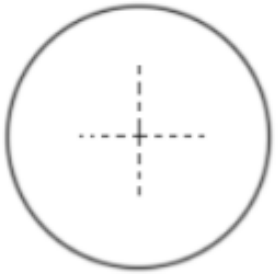
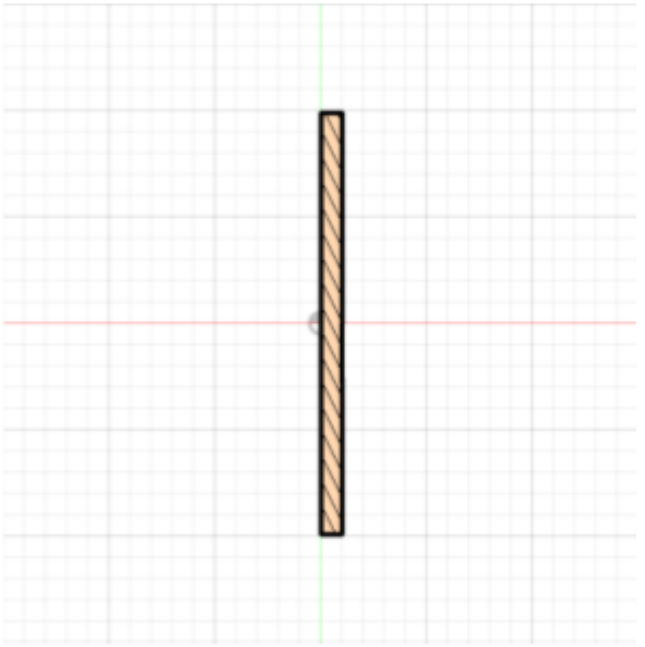
Orthographic and sectional	Section 6, Group 8		
	Sheet 1 / 1	Edition	Sheet 1 / 1

Name: Before End Most Disc
Material Used: GI Steel(Green)
Processing: Sheet Metal Cutting and Rolling









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Orthographic and sectional	Section 6, Group 8		
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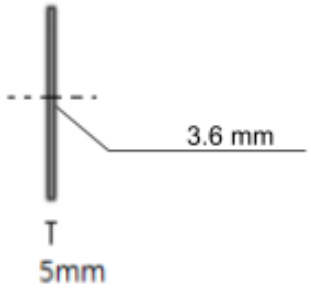
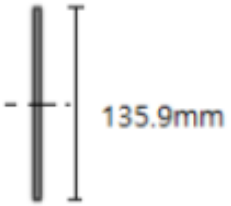
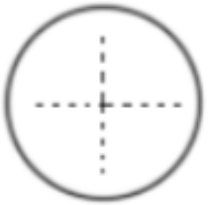
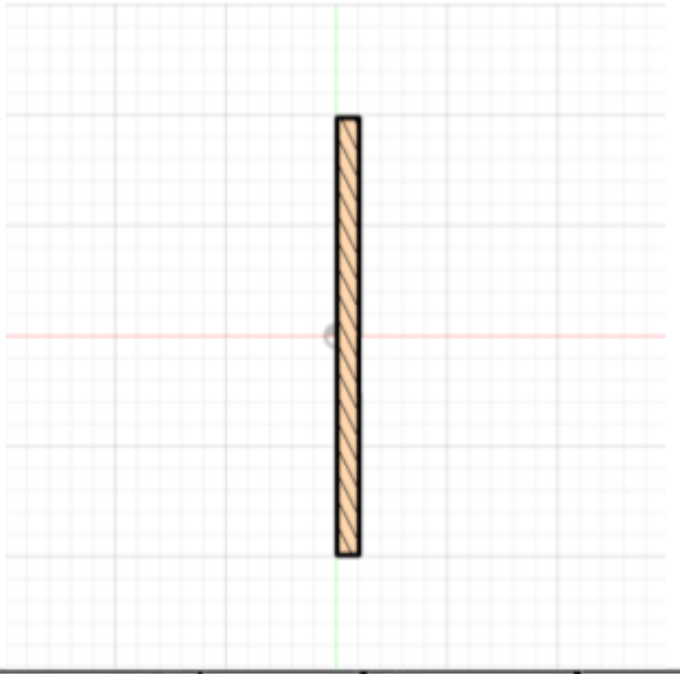


Name: End Most Disc
Material Used: GI Steel(Green)
Processing: Sheet Metal Cutting and Rolling







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Orthographic and sectional	Section 6, Group 8		
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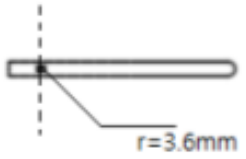
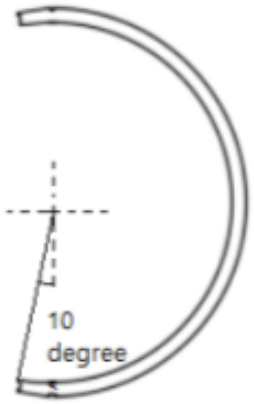
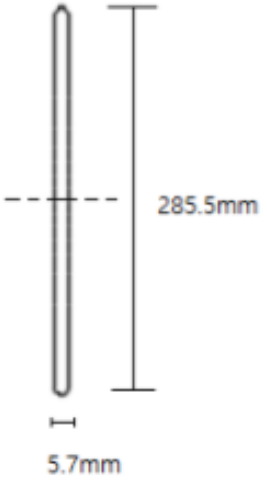


Name: Axis Holding Cylindrical Rod
Material Used: Mild Steel Rod
Processing: Sand Casting, Welding (for attaching)





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Orthographic and sectional	Section 6, Group 8		
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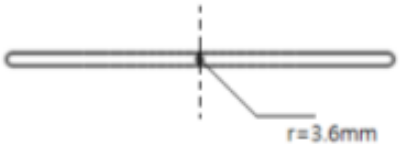
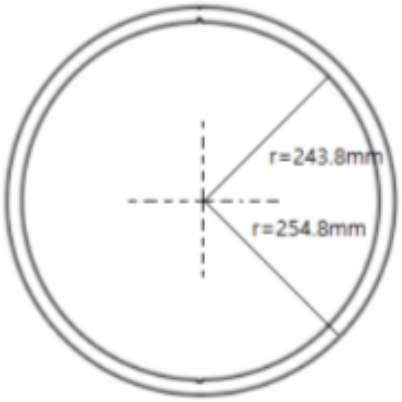
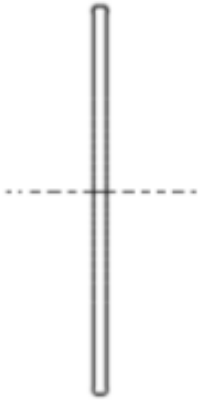
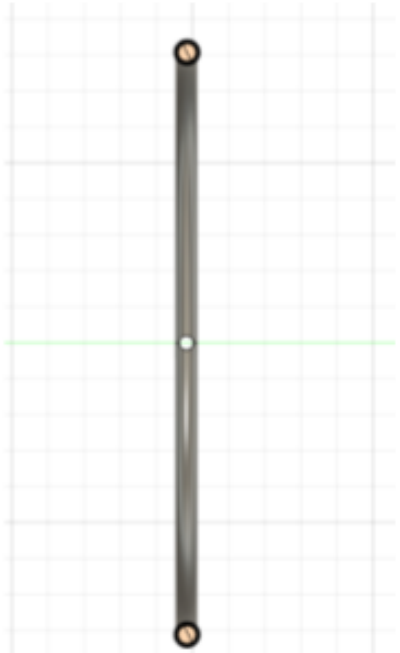
Name: Plate Holding Cylindrical Rod
Material Used: GI steel flat
Processing: Sand Casting









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Orthographic and sectional	Section 6, Group 8		
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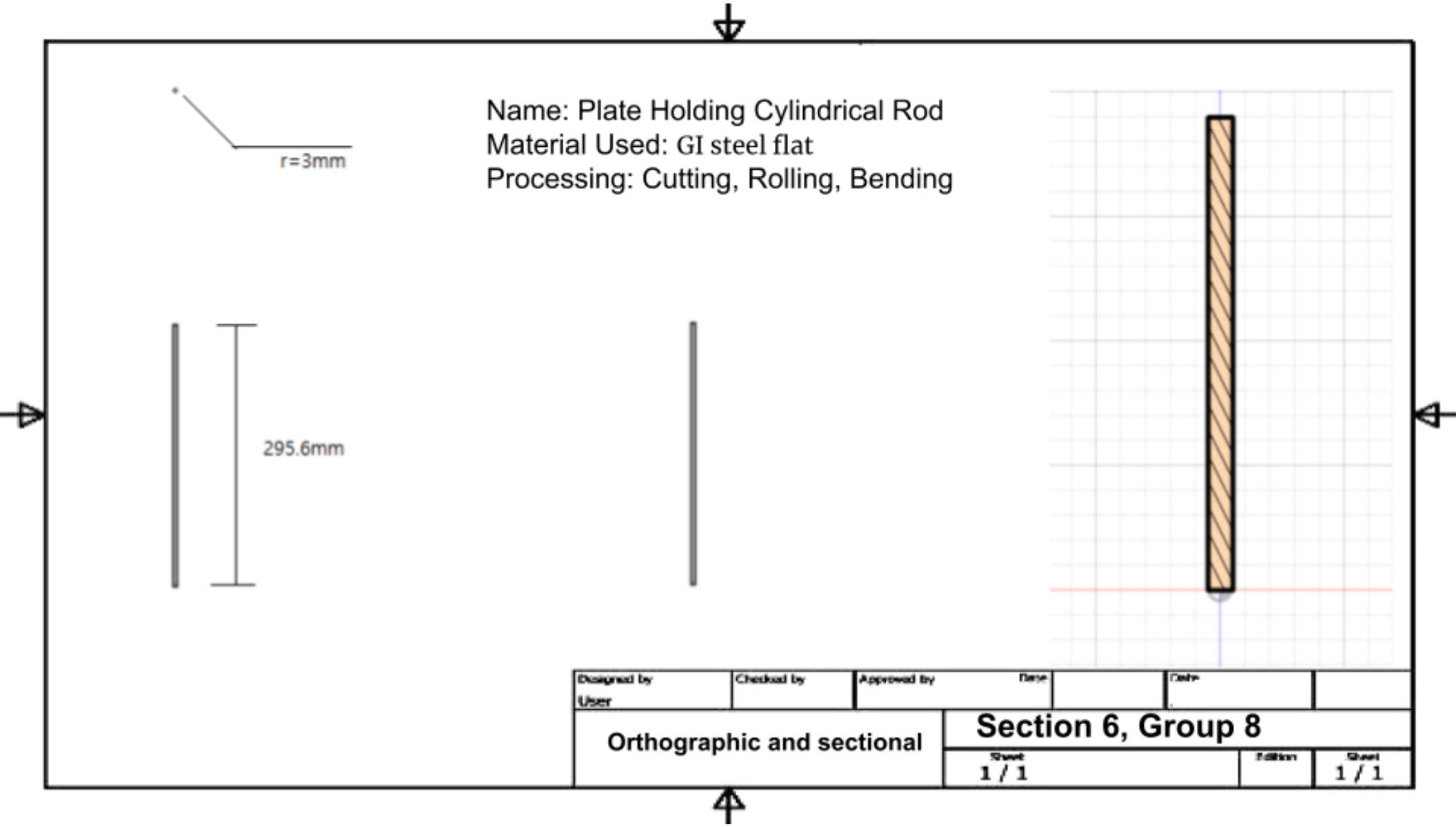
r=3mm
Name: Plate Holding Cylindrical Rod
Material Used: GI steel flat
Processing: Cutting, Rolling, Bending
295.6mm
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User
Checked by
Approved by
Name
Date
Orthographic and sectional
Section 6, Group 8
Sheet
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Edition
Sheet
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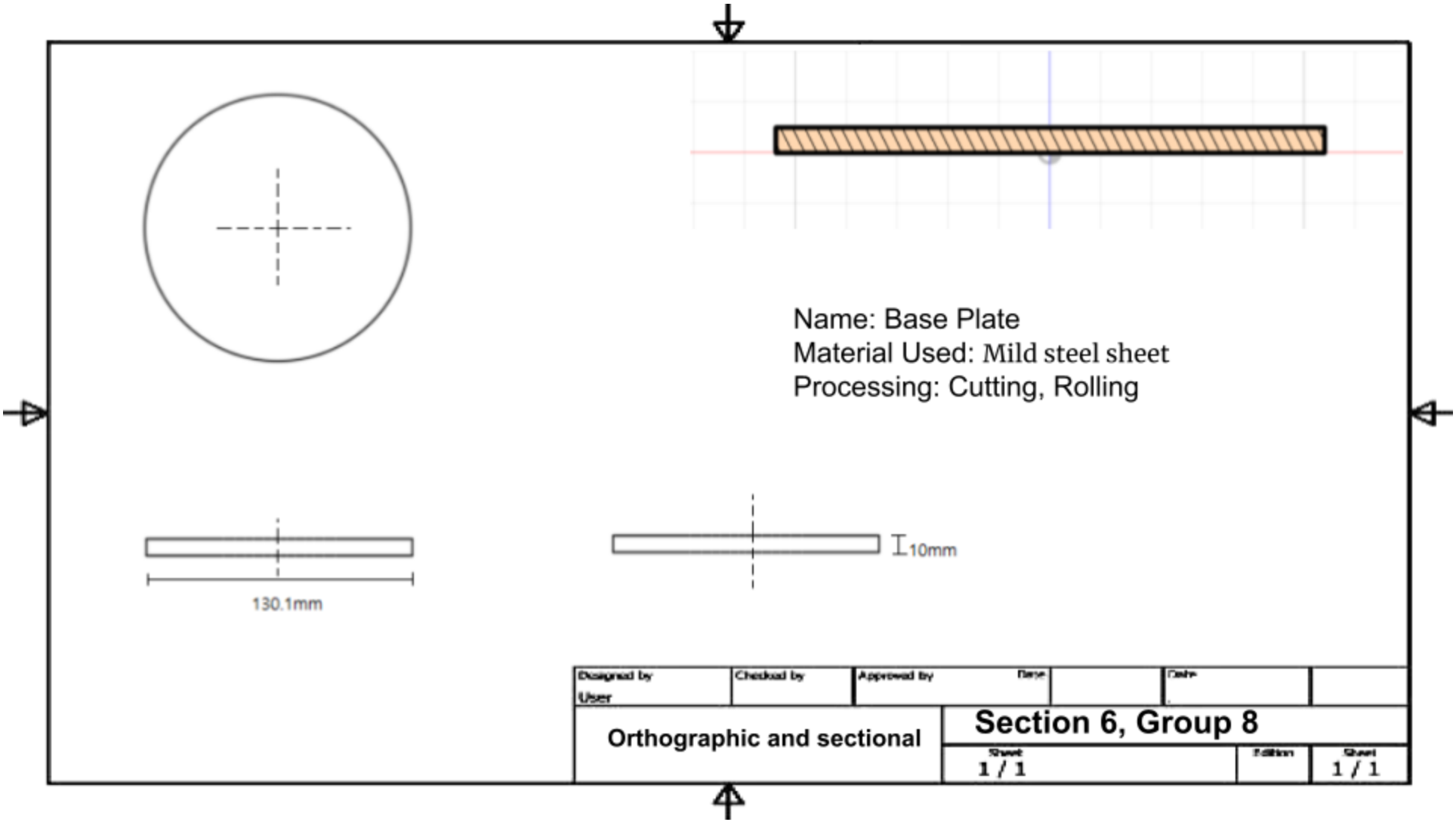
Name: Base Plate
Material Used: Mild steel sheet
Processing: Cutting, Rolling
130.1mm
10mm
User
Orthographic and sectional
Section 6, Group 8
1 / 1
1 / 1

Thank You