GLOSSARY

1. **DXF**

   (Data Exchange Format) This file is widely used in general design software.

2. **LED**

   (Light Emitting Diode) is an electronic component that can light up when given a current

3. **PLA**

   (Polylactic Acid) Is the type of filament that is most often used because of its convenience.

4. **PWM**

   (Pulse With Modulation) is a method in electronic circuits that converts direct current into alternating current.

5. **STL**

   (Stereolithography File) Used to produce 3D which contains 3D designs which are used as the main model to create many prototypes.

REFERENCES

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Badri, S. 2020. *Human Machine Interface for Step-up DC-DC Converter*. http://www.warse.org/IJATCSE/static/pdf/file/ijatcse296942020.pdf , Accessed on June 8 2021.

APPENDIX

ARDUINO PROGRAM

```
#include <Servo.h>
#include <HX711.h>
#define calibration_factor 500.0
#define DOUT  3
#define CLK  4
HX711 scale;

bool flag1 = false;
float mycarrier[6];

Servo servo1;
Servo servo2;
Servo servo3;

int IRSensor = 2;
int state = 0;

void setup() {
  Serial.begin(115200);
  Serial.println("HX711 scale demo");

  scale.begin(DOUT, CLK);
  scale.set_scale(calibration_factor);
  scale.tare(); //Assuming there is no weight on the scale at start up, reset the scale to 0

  Serial.println("Readings:");

  servo1.attach(10);
```

```
  servo2.attach(11);
  servo3.attach(12);
  servo1.write(0);
  servo2.write(0);
  servo3.write(0);

  pinMode (IRSensor, INPUT); // sensor pin INPUT
}

void loop() {
  int statusSensor = digitalRead (IRSensor);
  if (statusSensor == 1 && state == 0) {
    state = 1;
  }
  else if (state == 1) {
    storeweight();
    checkweight();
    carrierpass();
    state = 2;
  }
  else if (state == 2 && statusSensor == 0) {
    state = 0;
  }
}

void storeweight()
{
  mycarrier[5] = mycarrier[4];
  mycarrier[4] = mycarrier[3];
  mycarrier[3] = mycarrier[2];
  mycarrier[2] = mycarrier[1];
  mycarrier[1] = mycarrier[0];
  Serial.print("Weight on Carrier 1 : ");
```

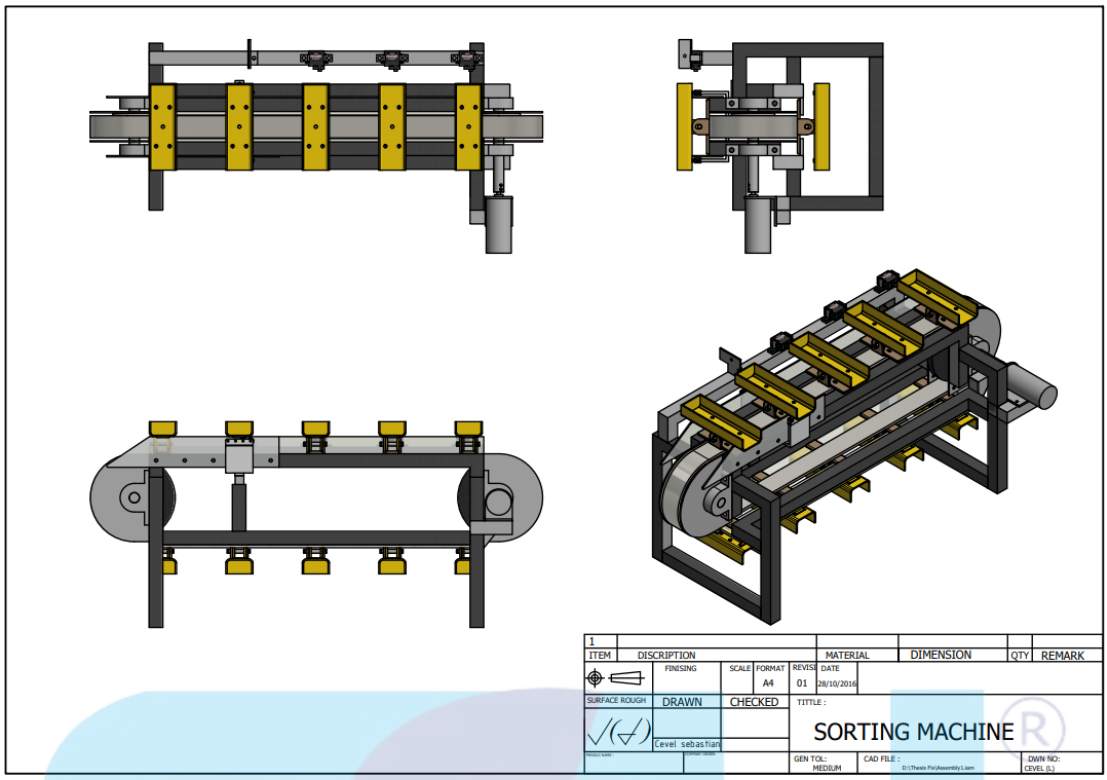
```
  Serial.println(mycarrier[0]);
  Serial.print("Weight on Carrier 2 : ");
  Serial.println(mycarrier[1]);
  Serial.print("Weight on Carrier 3 : ");
  Serial.println(mycarrier[2]);
  Serial.print("Weight on Carrier 4 : ");
  Serial.println(mycarrier[3]);
}

void checkweight()
{
  Serial.print(   "\t");
  Serial.print("Reading: ");
  Serial.print(scale.get_units(5), 0); //scale.get_units() returns a float
  Serial.print(" gram"); //You can change this to kg but you'll need to refactor the
calibration_factor
  Serial.println();
  if (scale.get_units(5) > 20)
  {
    flag1 = true;

  }

  if (flag1 == true && scale.get_units(5) < 20)
  {
    scale.tare();
    flag1 == false;
  }
  mycarrier[0] = scale.get_units();
}

void carrierpass ()
{
```

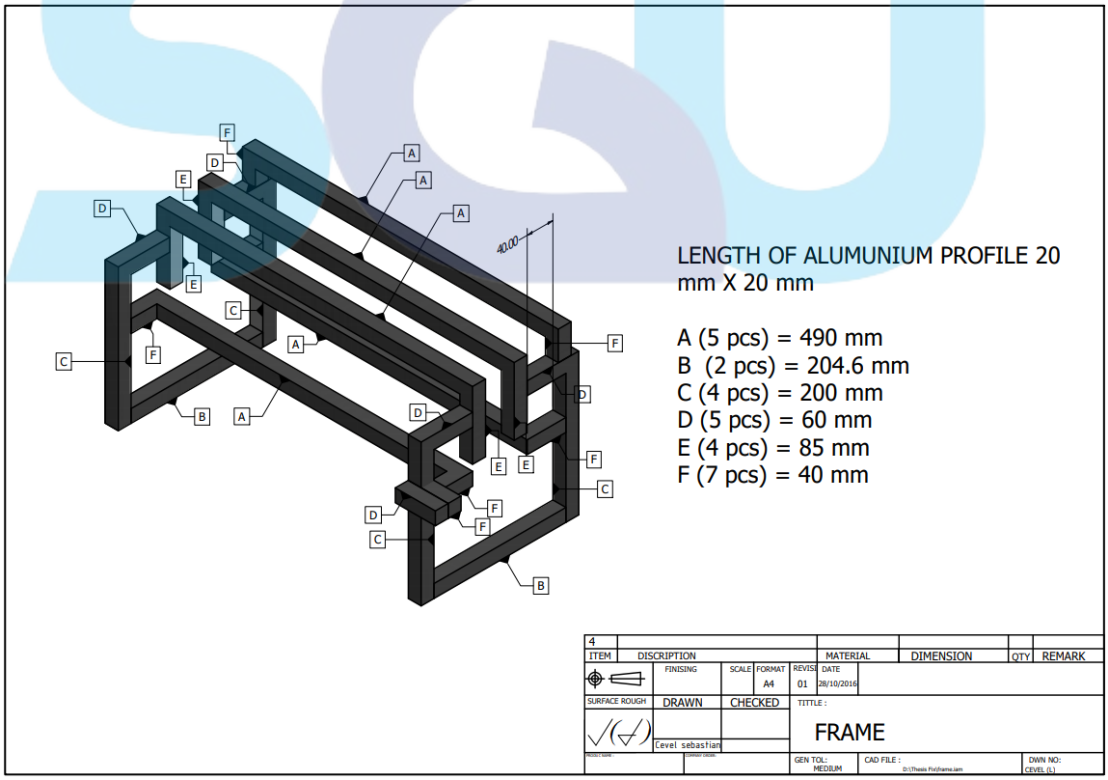
```
  if (mycarrier[1] >= 40 && mycarrier[1] < 50) {
    servo1.write(60);
  } else {
    servo1.write(0);
  }
  if (mycarrier[3] >= 33 && mycarrier[3] < 40) {
    servo2.write(60);
  } else {
    servo2.write(0);
  }
  if (mycarrier[5] >= 24 && mycarrier[5] < 33) {
    servo3.write(60);
  } else {
    servo3.write(0);
  }
}
```

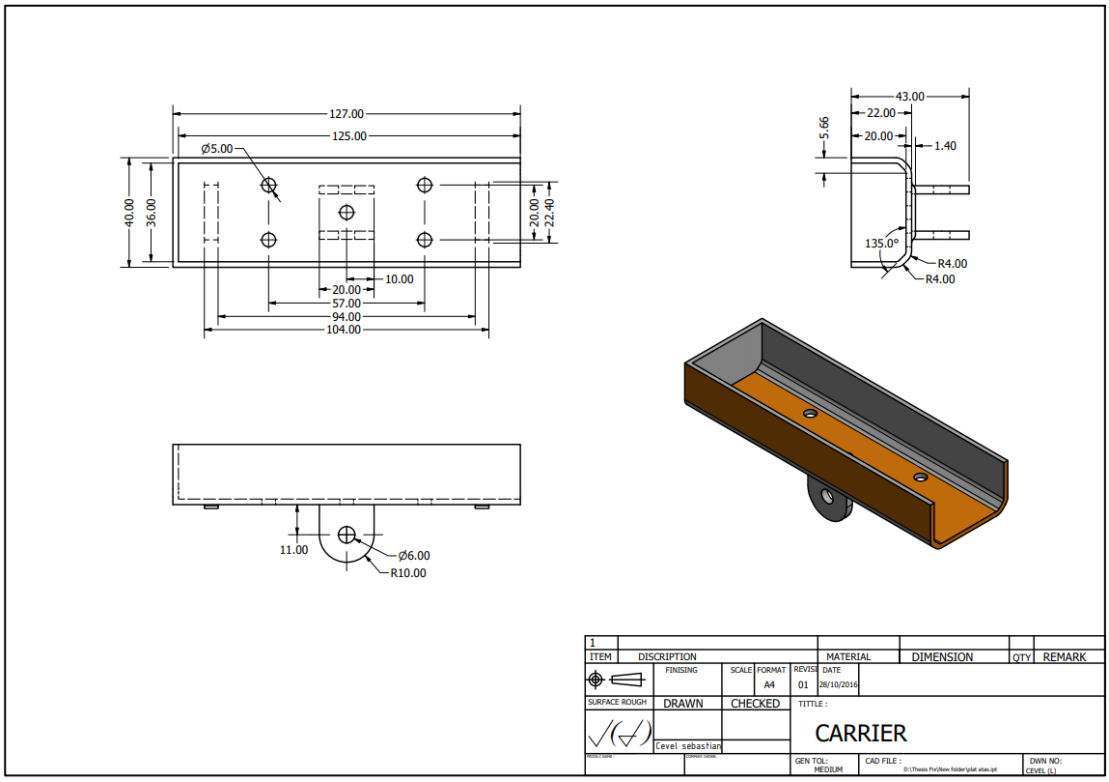
Bill Of Material

NO	Quantity	Part	Price	Vendor
1	6 m	Alumunium Profile 20mmx20mm	348000	Tokopedia
2	12 pcs	Roller Nylon 10mm	72000	Tokopedia
3	2 pcs	Sprocket RS 40-28 T	121400	Tokopedia
4	1 pcs	Chain RS 40 K1	430000	Tokopedia
5	1 pcs	Bracket Motor	17000	Tokopedia
6	50 pcs	Gusset	134000	Tokopedia
7	1 pcs	Shaft besi 15mmx50cm	35000	Tokopedia
8	4 pcs	Pillow block bore 15mm	166600	Tokopedia
9	6 pcs	Set Screw M8x20mm	28800	Tokopedia
10	120 pcs	T nut M5	144000	Tokopedia
11	120 pcs	Baut M5 + Ring	20000	Tokopedia
12	80 pcs	Baut M3 + Nut + Ring	10000	Tokopedia
13	1000 g	3D print	1E+06	Tokopedia
14	1 pcs	Arduino	168500	Tokopedia
15	3 pcs	Kabel jumper Arduino	38000	Tokopedia
16	1 pcs	Load Cell	119000	Tokopedia
17	1 pcs	HX711	52900	Tokopedia
18	1pcs	DC motor 37GB	190000	Tokopedia
19	1 pcs	PSU 24V 5A	60000	Tokopedia
20	1 pcs	10A PWM speed controller	67000	Tokopedia
21	3 pcs	Servo Sg90	54000	Tokopedia
Total			3276200	

Mechanical Drawing



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22.00
20.00
1.40
5.66
135.0°
R4.00
R4.00
11.00
Ø6.00
R10.00
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FINISING
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Cevel sebastian
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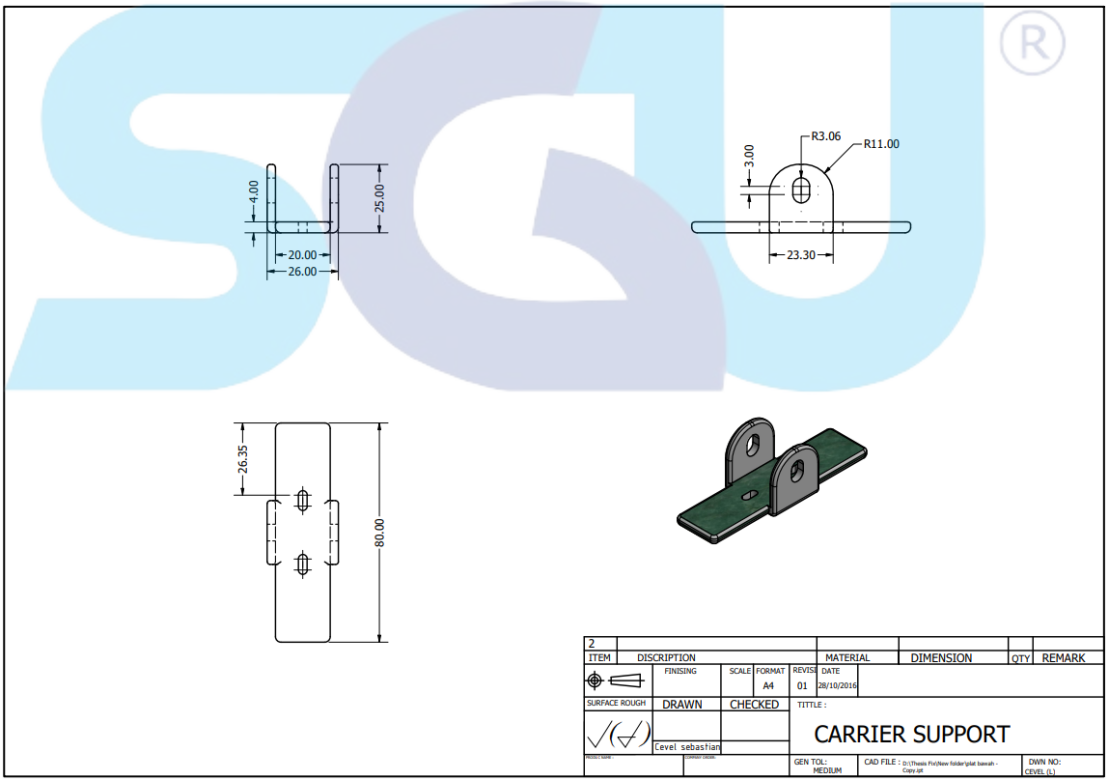
CARRIER
GEN TOL:
MEDIUM
CAD FILE :
DWN NO:
CEVEL (L)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R11.00
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QTY
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FORMAT
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DATE
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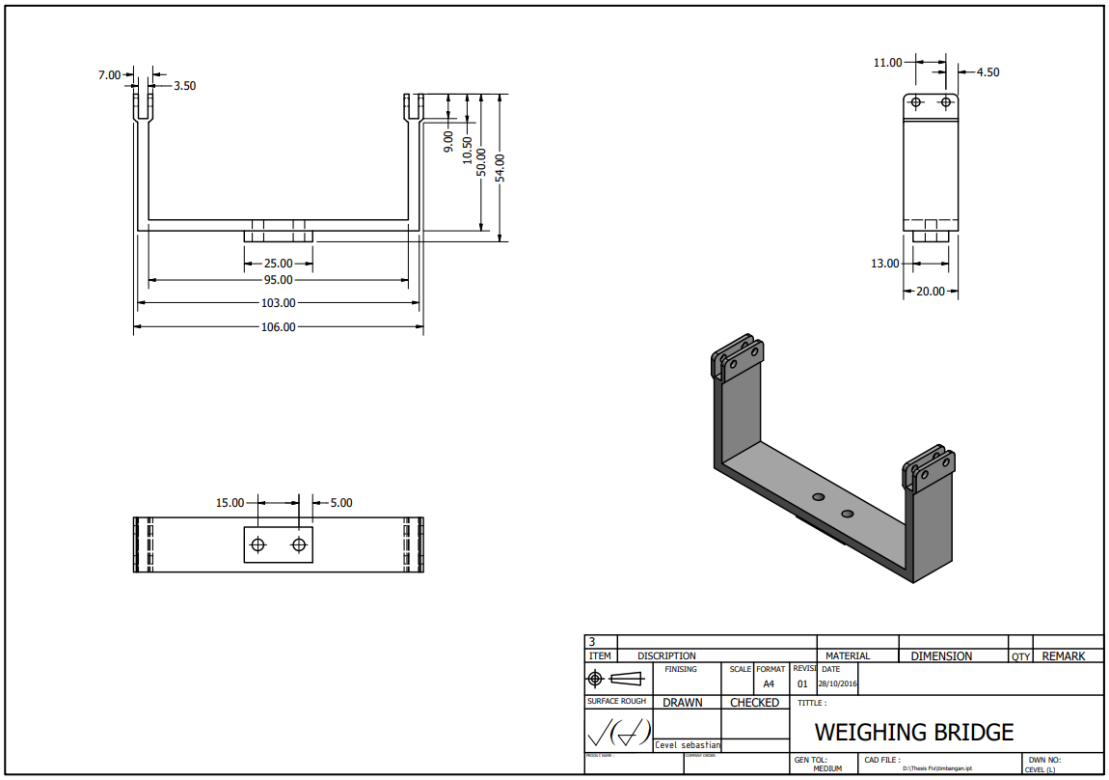
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20.00
15.00
5.00
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MEDIUM
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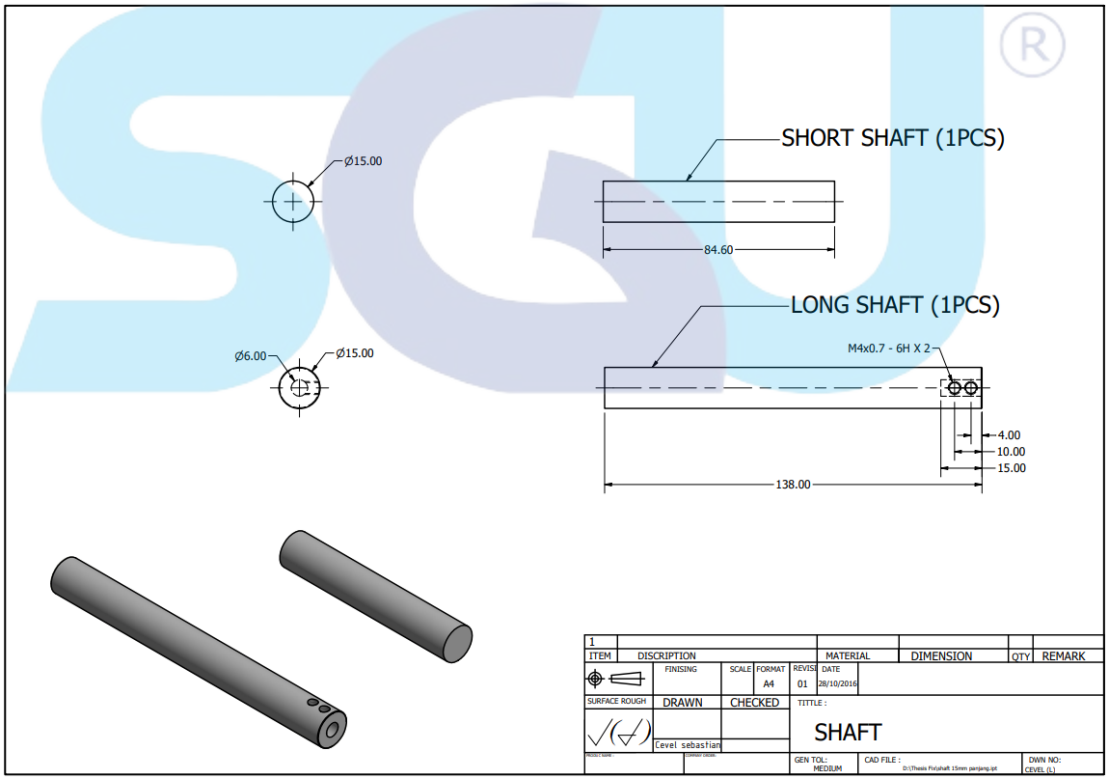
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LONG SHAFT (1PCS)
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10.00
15.00
138.00
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QTY
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FINISING
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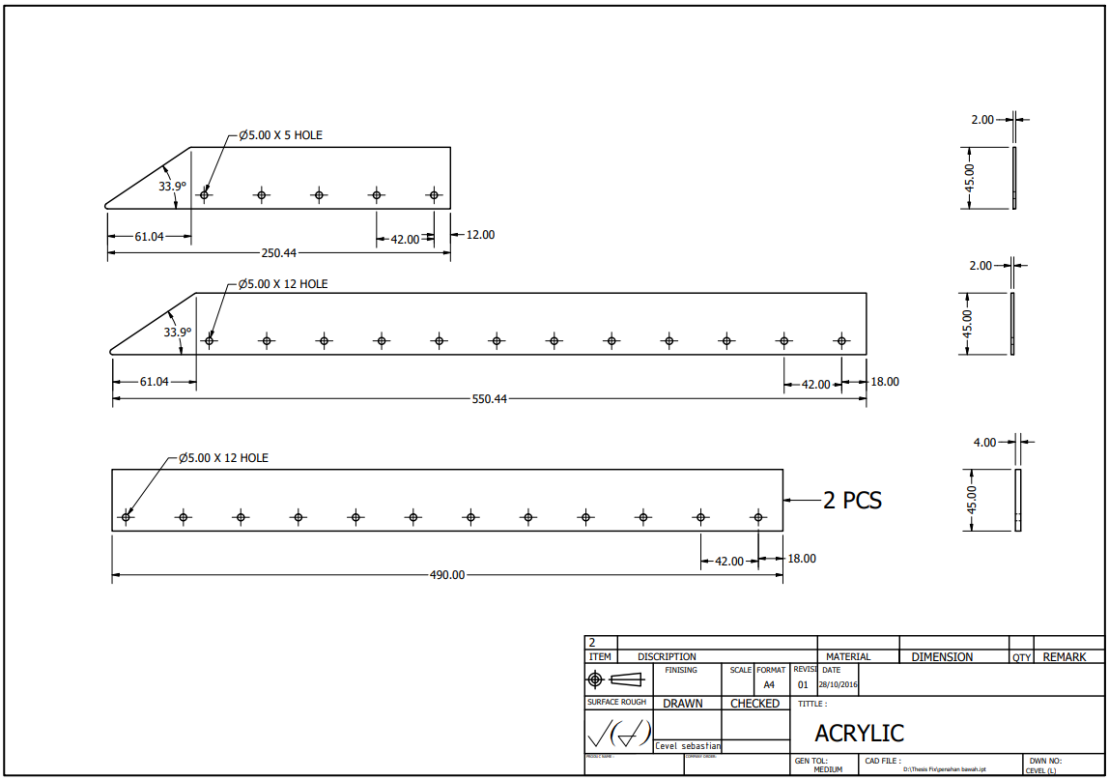
CEVEL (L)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61.04
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45.00
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2 PCS
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45.00
2
ITEM
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TITTLE :
ACRYLIC
GEN TOL:
MEDIUM
CAD FILE :
DWN NO:
CEVEL (L)

CURRICULUM VITAE

CEVEL SEBASTIAN

Personal Data

Date and place of birth:
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Interests and Hobbies

Swimming
E-Sport
Fishing

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Jakarta, 13 June 2021

(Cevel Sebastian)

EDUCATION

since 2017
Swiss German University Indonesia
Subject : Mechatronics

SCHOOL EDUCATION

2014 – 2017
High school STRADA in Jakarta, Indonesia with a high school diploma

TRAINING & INTERNSHIP SEMESTER

March 2020 – July 2020
at Deutsche E-Bike Akkuservice in Werl, Germany
Activities: Battery repaired, Design parts with Inventor, 3D Print operator.

October 2018 - December 2018
at Haosheng Trading (a compressor maintenance company) in Jakarta, Indonesia
Activities: Compressor repaired, pipes installed

July 2018 - September 2018
at the Technical Academy of Industrial Machines in Cikarang, Indonesia
Activities: milling, welding, CNC programming, grinding, technical drawing, building power supply

July 2016 - August 2016
at Cv.Citra Bersama (a workshop that makes machines to factory orders) in Tangerang, Indonesia
Activities: Drawing machine parts with Inventor

ACTIVITIES & MEMBERSHIPS

February 2019
Mechatronics Day Committee (Mechatronics - Competition for High School Students)

LANGUAGES

- Indonesian (mother tongue)
- English (good spoken and written)
- German (A2.1)

COMPUTER SKILLS:

- Microsoft
- Inventor
- Autocad
- Codesys
- G-code
- Photoshop
- Solidwork
- Proteus 8 Professional
- Pneumatic
- PLC