

# LAMPIRAN

**LAMPIRAN 1**  
**DAFTAR RIWAYAT HIDUP**

**A. DATA PRIBADI**

Nama : Rizal Fatha Nugraha  
Tempat, Tanggal Lahir : Purbalingga, 7 September 2000  
Jenis Kelamin : Laki-laki  
Agama : Islam  
Status : Belum menikah  
Kewarganegaraan : Indonesia  
Alamat : Perumahan Kodim 0703 No.K-29 RT.07/RW.09  
Sidakaya, Cilacap Selatan, Cilacap, Jawa Tengah  
No. Telp : 088228800203  
E-mail : [fatharizal@gmail.com](mailto:fatharizal@gmail.com)  
Hobi : Sepakbola



**B. RIWAYAT PENDIDIKAN FORMAL**

1. 2007-2013 SD Negeri 2 Bojong
2. 2013-2016 SMP Negeri 4 Cilacap
3. 2013-2019 SMK Negeri 2 Cilacap

## LAMPIRAN 2

### KUESIONER RANCANG BANGUN MESIN BELT SANDER

| No | Pertanyaan   | Ya | Tidak |
|----|--|----|-------|
| 1  | Apakah proses pengamplasan pada kegiatan praktikum di bengkel jurusan teknik mesin Politeknik Negeri Cilacap diperlukan ?            | ✓  |       |
| 2  | Apakah mayoritas pekerjaan pada praktikum di bengkel jurusan teknik mesin Politeknik Negeri Cilacap memerlukan proses pengamplasan ? | ✓  |       |
| 3  | Apakah terdapat mesin amplas di bengkel jurusan teknik mesin Politeknik Negeri Cilacap ?   |    | ✓     |
| 4  | Apakah mesin amplas diperlukan di bengkel jurusan teknik mesin Politeknik Negeri Cilacap ?   | ✓  |       |
| 5  | Kriteria Mesin Amplas :  |    |       |
|    | 1. Kemudahan peanggantian amplas   | ✓  |       |
|    | 2. Kecepatan pengamplasan dapat diatur   | ✓  |       |
|    | 3. Terdapat pencekaman benda kerja   | ✓  |       |

Cilacap, September 2022

Responden

  
( Dwi Eka )

### LAMPIRAN 3

#### TABEL REFERENSI PERHITUNGAN

Harga  $Sf_1$  dan  $Sf_2$  (Sularso, 2008)

| Jenis bahan                           | $Sf_1$ | $Sf_2$  |
|---------------------------------------|--------|---------|
| Bahan SF dengan kekuatan yang dijamin | 5,6    | 1,3-3,0 |
| Bahan S-C dan baja paduan             | 6,0    | 1,3-3,0 |

Faktor koreksi momen puntir (Sularso, 2008)

| Beban yang dikenakan          | $K_t$   |
|-------------------------------|---------|
| Halus                         | 1,0     |
| Sedikit kejutan atau tumbukan | 1,0-1,5 |
| Kejutan atau tumbukan besar   | 1,5-3,0 |

Faktor  $C_b$  (Sularso, 2008)

| Pembebanan                              | $C_b$   |
|---|---------|
| Diperkirakan terjadi beban lentur       | 1,2-2,3 |
| Diperkirakan tidak terjadi beban lentur | 1,0     |

Kekuatan tarik bahan (Sularso, 2008)

Tabel 1.1 Baja karbon untuk konstruksi mesin dan baja batang yang difinis dingin untuk poros.

| Standar dan macam                         | Lambang | Perlakuan panas | Kekuatan tarik (kg/mm <sup>2</sup> ) | Keterangan  |
|---|---------|-----------------|--------------------------------------|---|
| Baja karbon konstruksi mesin (JIS G 4501) | S30C    | Penormalan      | 48                                   |   |
|   | S35C    | "               | 52                                   |   |
|   | S40C    | "               | 55                                   |   |
|   | S45C    | "               | 58                                   |   |
|   | S50C    | "               | 62                                   |   |
|   | S55C    | "               | 66                                   |   |
| Batang baja yang difinis dingin           | S35C-D  | -               | 53                                   | ditarik dingin, digerinda, dibubut, atau gabungan antara hal-hal tersebut |
|   | S45C-D  | -               | 60                                   |   |
|   | S55C-D  | -               | 72                                   |   |

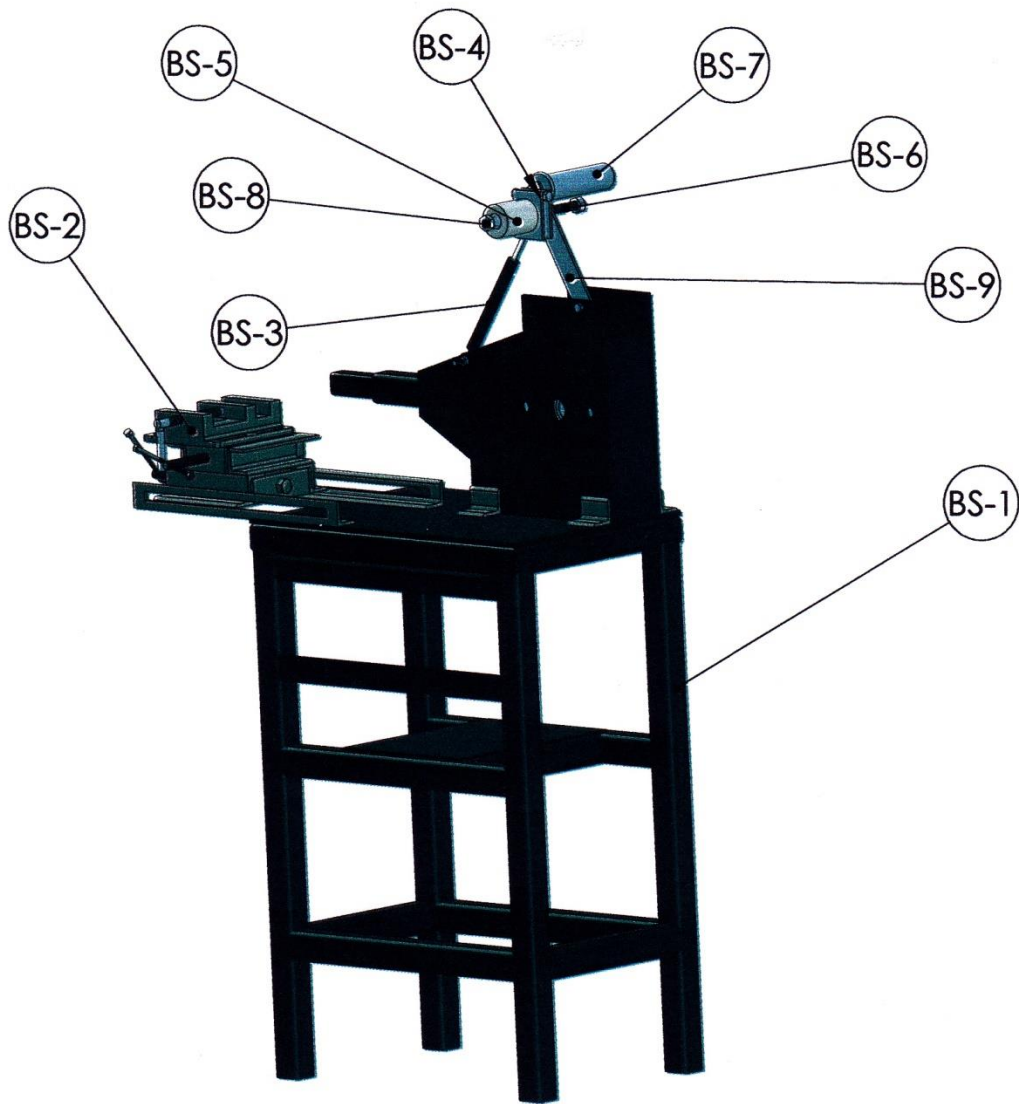
Koefisien gesek material (Ruwanto,Bambang, 2008)

| No | Permukaan                  | Koefisien Gesekan Statis ( $\mu_s$ ) | Koefisien Gesekan Kinetis ( $\mu_k$ ) |
|----|----------------------------|--------------------------------------|---------------------------------------|
| 1  | Kayu pada kayu             | 0,40                                 | 0,20                                  |
| 2  | Kayu pada baja             | 0,70                                 | 0,40                                  |
| 3  | Kayu pada salju            | 0,08                                 | 0,06                                  |
| 4  | Baja pada baja             | 0,74                                 | 0,57                                  |
| 5  | Aluminium pada baja        | 0,61                                 | 0,47                                  |
| 6  | Tembaga pada baja          | 0,53                                 | 0,36                                  |
| 7  | Kaca pada kaca             | 0,94                                 | 0,40                                  |
| 8  | Tembaga pada kaca          | 0,64                                 | 0,53                                  |
| 9  | Teflon pada Teflon         | 0,04                                 | 0,04                                  |
| 10 | Teflon pada baja           | 0,04                                 | 0,04                                  |
| 11 | Karet pada beton(kering)   | 1,00                                 | 0,80                                  |
| 12 | Karet pada beton (berair)  | 0,30                                 | 0,25                                  |
| 13 | Bola gotri yang diberi oli | < 0.01                               | < 0.01                                |

**LAMPIRAN 4**  
**DESAIN GAMBAR**




| JML   | NAMA BAGIAN |      |      |      |      | POS  | BAHAN            | UKURAN JADI | UKURAN KASAR                | NO. ID  | F |  |
|---|-------------|------|------|------|------|------|------------------|-------------|-----------------------------|---|---|--|
| >   | 0           | 6    | 30   | 120  | 400  | 1000 | PEKERJAAN LANJUT | NO. ORDER   | PROYEKSI                    |   |   |  |
| <   | 6           | 30   | 120  | 400  | 1000 | 2000 |                  |             |                             |   |   |  |
| TOL   | ±0.1        | ±0.2 | ±0.3 | ±0.5 | ±0.8 | ±1.2 |                  |             |                             |   |   |  |
| <b>NAMA</b><br><h1>MESIN BELT SANDER</h1>   |             |      |      |      |      |      |                  |             | <b>SKALA</b><br><b>1:10</b> | <b>DIGAMBAR</b><br>RIZAL<br><b>DIPERIKSA</b><br><br><b>DISAHKAN</b><br><br> |   |  |
| <b>NO. ASSY : -</b>   |             |      |      |      |      |      |                  |             | <b>FORMAT</b><br>A4         | <h2>BS/01</h2>  |   |  |
| <b>POLITEKNIK NEGERI CILACAP</b><br>TELP. (0282) 533329 EMAIL : polcap@yahoo.co.id<br>JL. Dr. SOETOMO, SIDAKAYA, CILACAP, 53212 |             |      |      |      |      |      |                  |             |                             |   |   |  |



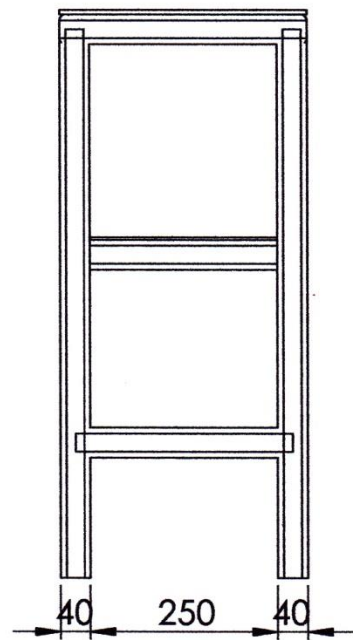
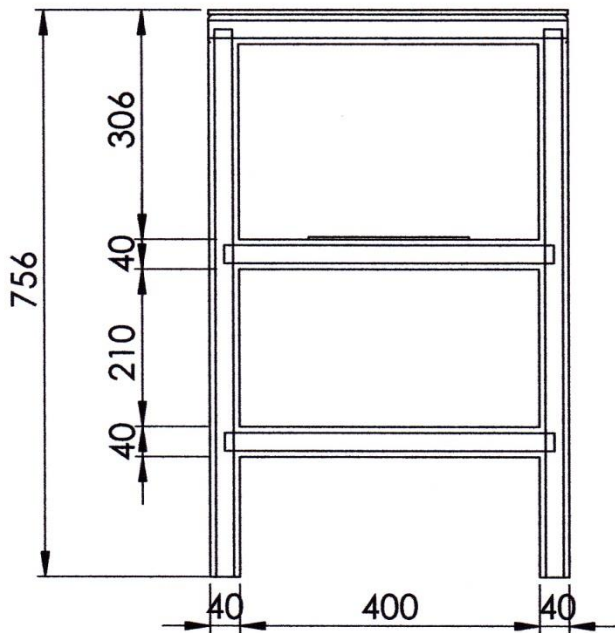
|   |                 |  |  |                 |  |      |
|---|-----------------|--|--|-----------------|--|------|
| 1 | Tangkai idler   |  |  | 195 X 30 X 4    |  | BS-9 |
| 1 | Poros idler     |  |  | Ø 12 X 85       |  | BS-8 |
| 1 | Handle          |  |  | Ø 40 X 145      |  | BS-7 |
| 1 | Pengatur engsel |  |  | Ø 12 X 100      |  | BS-6 |
| 1 | Roller          |  |  | Ø 45 X 60       |  | BS-5 |
| 1 | Engsel          |  |  | 65 X 62 X 20    |  | BS-4 |
| 1 | Tensioner       |  |  | Ø 15 X 300      |  | BS-3 |
| 1 | Tool holder     |  |  |                 |  | BS-2 |
| 1 | Rangka          |  |  | 756 X 480 X 330 |  | BS-1 |

| JML | NAMA BAGIAN |      |      |      |      |      | POS              | BAHAN | UKURAN JADI | UKURAN KASAR | NO. ID | F |
|-----|-------------|------|------|------|------|------|------------------|-------|-------------|--------------|--------|---|
| >   | 0           | 6    | 30   | 120  | 400  | 1000 | PEKERJAAN LANJUT |       | NO. ORDER   | PROYEKSI     |        |   |
| <   | 6           | 30   | 120  | 400  | 1000 | 2000 |                  |       |             |              |        |   |
| TOL | ±0.1        | ±0.2 | ±0.3 | ±0.5 | ±0.8 | ±1.2 |                  |       |             |              |        |   |

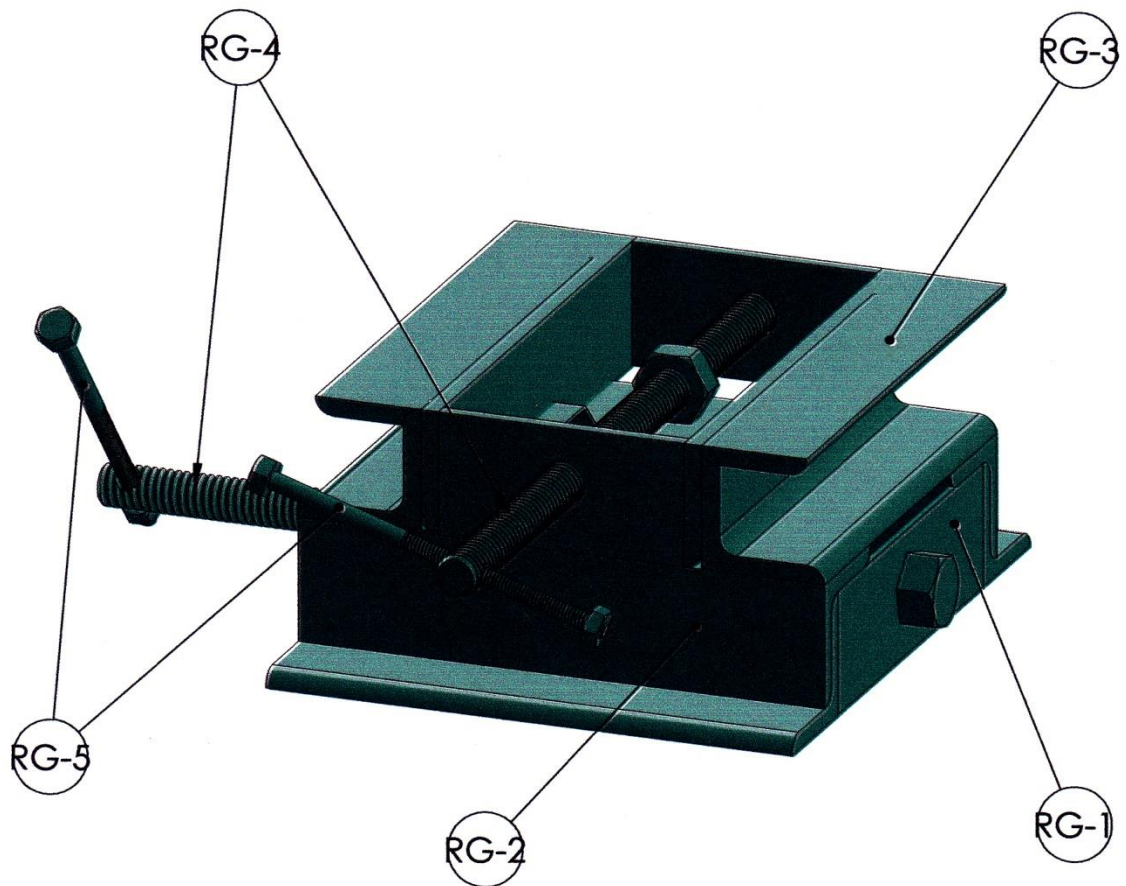
|  |       |           |       |  |
|--|-------|-----------|-------|--|
| NAMA<br><br><h1 style="text-align: center;">BELT SANDER</h1> | SKALA | DIGAMBAR  | RIZAL |  |
|  | 1:10  | DIPERIKSA |       |  |
|  |       | DISAHKAN  |       |  |
|  |       |           |       |  |

|   |              |
|---|--------------|
| NO. ASSY : -<br> <b>POLITEKNIK NEGERI CILACAP</b><br>TELP. (0282) 533329 EMAIL : polcap@yahoo.co.id<br>JL. Dr. SOETOMO, SIDAKAYA, CILACAP, 53212 | FORMAT<br>A4 |
|---|--------------|





| JML   | NAMA BAGIAN |      |      |      |      | POS  | BAHAN            | UKURAN JADI | UKURAN KASAR | NO. ID | F |  |
|---|-------------|------|------|------|------|------|------------------|-------------|--------------|--------|---|--|
| >   | 0           | 6    | 30   | 120  | 400  | 1000 | PEKERJAAN LANJUT | NO. ORDER   |              |        |   |  |
| <   | 6           | 30   | 120  | 400  | 1000 | 2000 |                  |             |              |        |   |  |
| TOL   | ±0.1        | ±0.2 | ±0.3 | ±0.5 | ±0.8 | ±1.2 |                  |             |              |        |   |  |
| NAMA  |             |      |      |      |      |      |                  | SKALA       | DIGAMBAR     | RIZAL  |   |  |
| <b>BS-1</b>   |             |      |      |      |      |      |                  | 1:10        | DIPERIKSA    |        |   |  |
|   |             |      |      |      |      |      |                  |             | DISAHKAN     |        |   |  |
| NO. ASSY : -  |             |      |      |      |      |      |                  | FORMAT      |              |        |   |  |
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|   |                      |  |  |                      |  |      |  |
|---|----------------------|--|--|----------------------|--|------|--|
| 2 | Baut M6 X 1          |  |  | $\phi 6 \times 104$  |  | RG-5 |  |
| 2 | Baut M12 X 1,75      |  |  | $\phi 12 \times 250$ |  | RG-4 |  |
| 1 | Dudukan ragum atas   |  |  | 150 X 150 X 40       |  | RG-3 |  |
| 1 | Dudukan ragum tengah |  |  | 140 X 160 X 80       |  | RG-2 |  |
| 1 | Dudukan ragum bawah  |  |  | 160 X 190 X 40       |  | RG-1 |  |

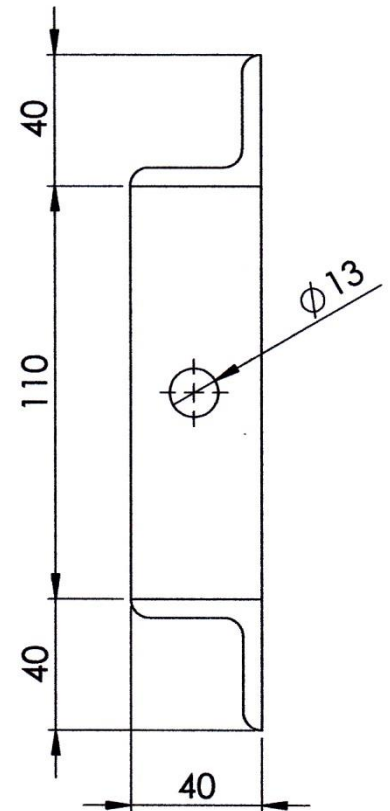
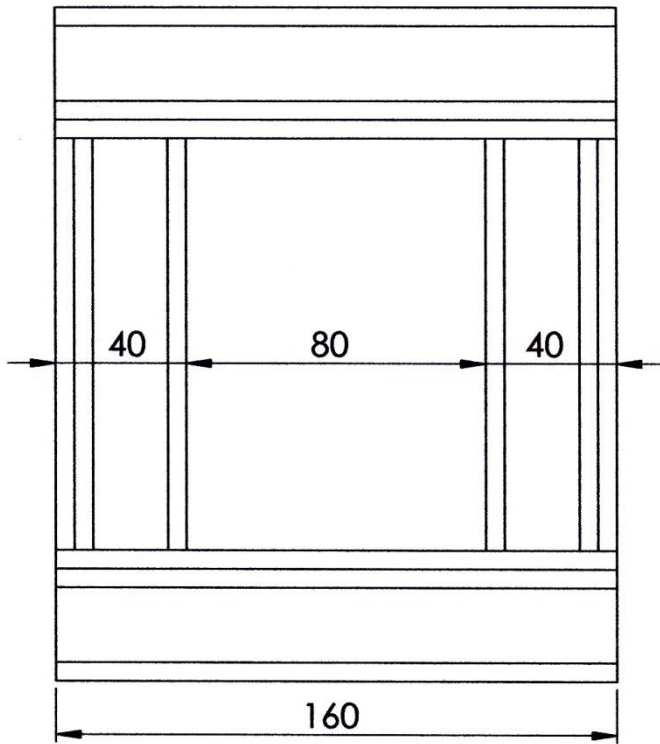
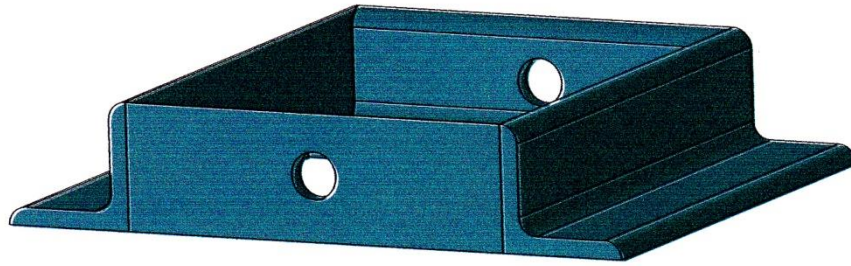
| JML | NAMA BAGIAN |           |           |           |           |           | POS              | BAHAN | UKURAN JADI | UKURAN KASAR | NO. ID | F |
|-----|-------------|-----------|-----------|-----------|-----------|-----------|------------------|-------|-------------|--------------|--------|---|
| >   | 0           | 6         | 30        | 120       | 400       | 1000      | PEKERJAAN LANJUT |       | NO. ORDER   | PROYEKSI     |        |   |
| <   | 6           | 30        | 120       | 400       | 1000      | 2000      |                  |       |             |              |        |   |
| TOL | $\pm 0.1$   | $\pm 0.2$ | $\pm 0.3$ | $\pm 0.5$ | $\pm 0.8$ | $\pm 1.2$ |                  |       |             |              |        |   |

|   |       |           |       |  |
|---|-------|-----------|-------|--|
| NAMA<br><br><b>BS-2</b><br><br>NO. ASSY : - | SKALA | DIGAMBAR  | RIZAL |  |
|   | 1:10  | DIPERIKSA |       |  |
|   |       | DISAHKAN  |       |  |
|   |       |           |       |  |

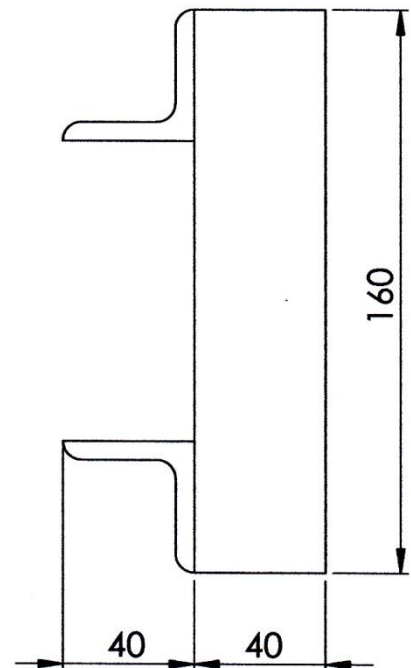
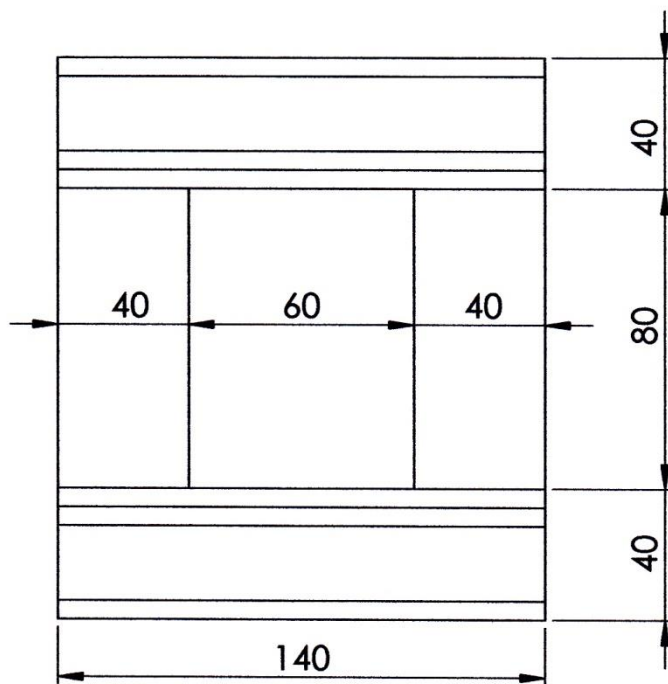
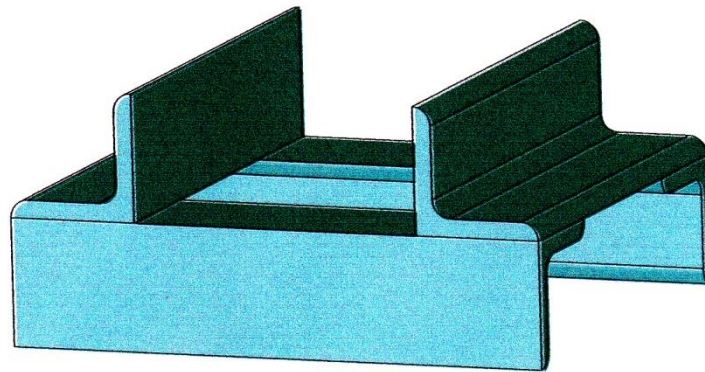


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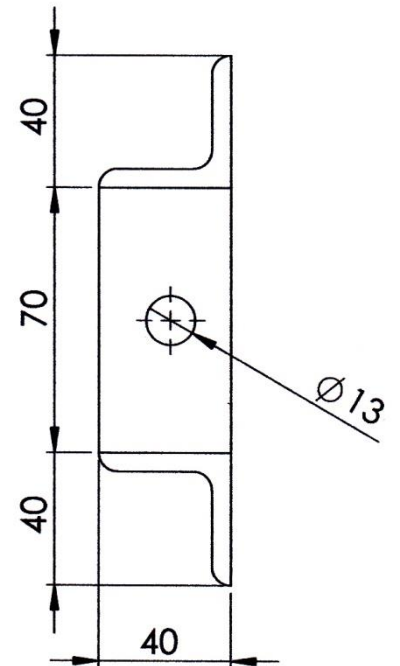
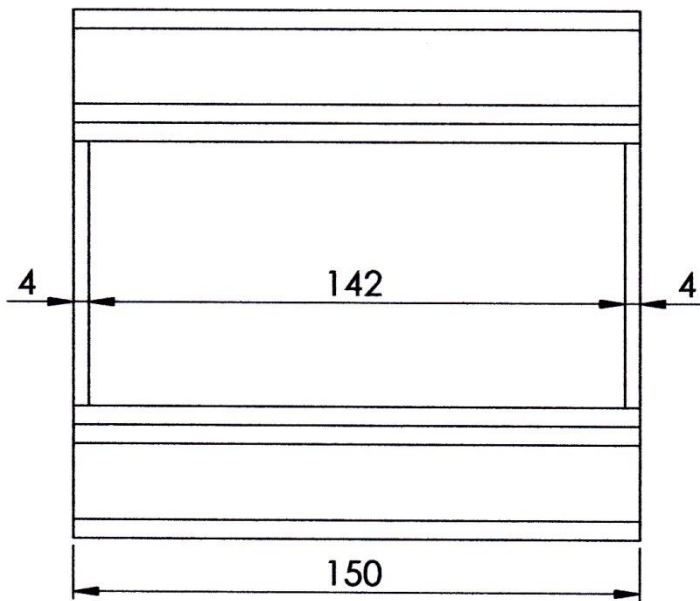
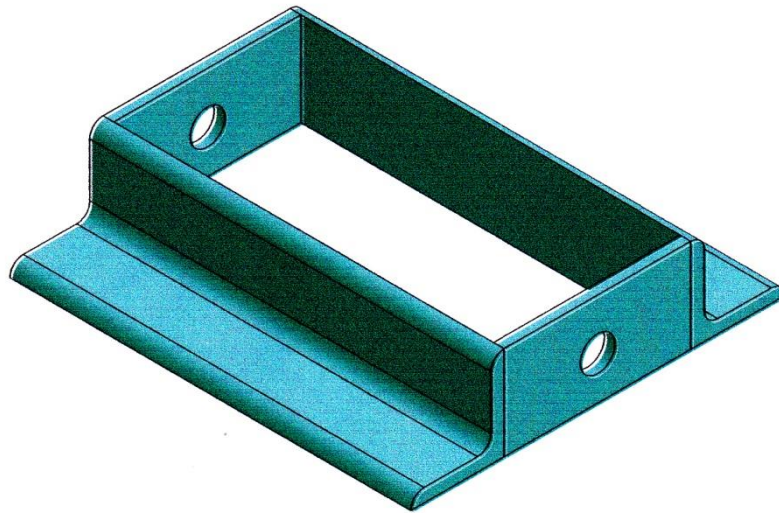
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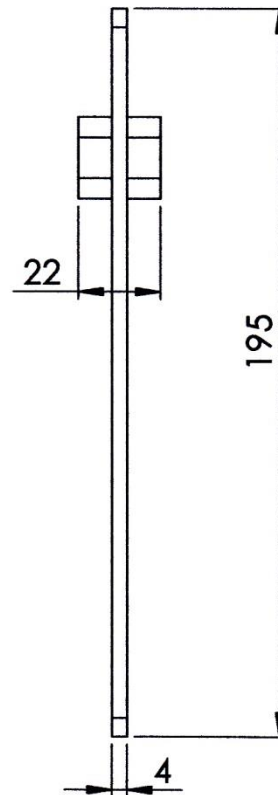
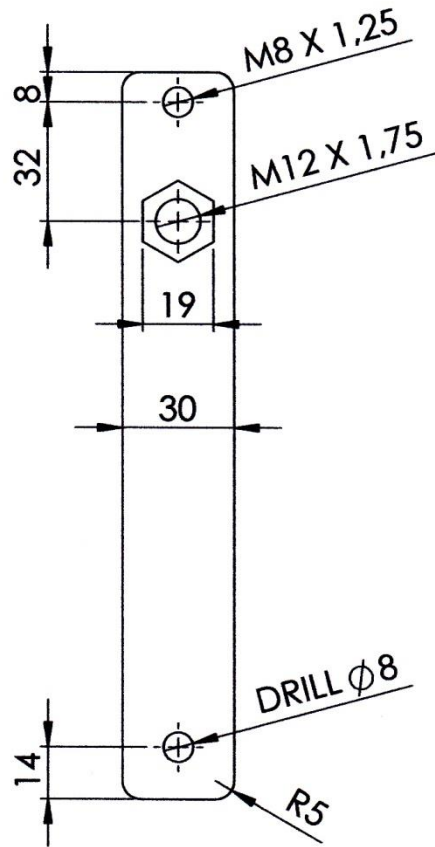
| JML   | NAMA BAGIAN |      |      |      |      |      | POS              | BAHAN | UKURAN JADI | UKURAN KASAR | NO. ID | F |
|---|-------------|------|------|------|------|------|------------------|-------|-------------|--------------|--------|---|
| >   | 0           | 6    | 30   | 120  | 400  | 1000 | PEKERJAAN LANJUT |       | NO. ORDER   | PROYEKSI     |        |   |
| <   | 6           | 30   | 120  | 400  | 1000 | 2000 |                  |       |             |              |        |   |
| TOL   | ±0.1        | ±0.2 | ±0.3 | ±0.5 | ±0.8 | ±1.2 |                  |       |             |              |        |   |
| NAMA  |             |      |      |      |      |      |                  |       | SKALA       | DIGAMBAR     | RIZAL  |   |
| <b>RG-1</b>   |             |      |      |      |      |      |                  |       | 1:2         | DIPERIKSA    |        |   |
|   |             |      |      |      |      |      |                  |       |             | DISAHKAN     |        |   |
| NO. ASSY : -  |             |      |      |      |      |      |                  |       | FORMAT      |              |        |   |
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|---|-------------|------|------|------|------|------|------------------|-------------|--------------|--------|---|
| >   | 0           | 6    | 30   | 120  | 400  | 1000 | PEKERJAAN LANJUT | NO. ORDER   | PROYEKSI<br> |        |   |
| <   | 6           | 30   | 120  | 400  | 1000 | 2000 |                  |             |              |        |   |
| TOL   | ±0.1        | ±0.2 | ±0.3 | ±0.5 | ±0.8 | ±1.2 |                  |             |              |        |   |
| NAMA  |             |      |      |      |      |      |                  | SKALA       | DIGAMBAR     | RIZAL  |   |
| <h1>RG-2</h1>   |             |      |      |      |      |      |                  | 1:2         | DIPERIKSA    |        |   |
|   |             |      |      |      |      |      |                  |             | DISAHKAN     |        |   |
| NO. ASSY : -  |             |      |      |      |      |      |                  | FORMAT      |              |        |   |
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| JML   | NAMA BAGIAN |      |      |      |      |      | POS              | BAHAN | UKURAN JADI | UKURAN KASAR | NO. ID | F |
|---|-------------|------|------|------|------|------|------------------|-------|-------------|--------------|--------|---|
| >   | 0           | 6    | 30   | 120  | 400  | 1000 | PEKERJAAN LANJUT |       | NO. ORDER   | PROYEKSI     |        |   |
| <   | 6           | 30   | 120  | 400  | 1000 | 2000 |                  |       |             |              |        |   |
| TOL   | ±0.1        | ±0.2 | ±0.3 | ±0.5 | ±0.8 | ±1.2 |                  |       |             |              |        |   |
| NAMA  |             |      |      |      |      |      |                  |       | SKALA       | DIGAMBAR     | RIZAL  |   |
| <b>RG-3</b>   |             |      |      |      |      |      |                  |       | 1:2         | DIPERIKSA    |        |   |
|   |             |      |      |      |      |      |                  |       |             | DISAHKAN     |        |   |
|   |             |      |      |      |      |      |                  |       |             |              |        |   |
| NO. ASSY : -  |             |      |      |      |      |      |                  |       | FORMAT      |              |        |   |
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| JML   | NAMA BAGIAN |      |      |      |      | POS  | BAHAN            | UKURAN JADI | UKURAN KASAR | NO. ID | F |
|---|-------------|------|------|------|------|------|------------------|-------------|--------------|--------|---|
| >   | 0           | 6    | 30   | 120  | 400  | 1000 | PEKERJAAN LANJUT | NO. ORDER   |              |        |   |
| <   | 6           | 30   | 120  | 400  | 1000 | 2000 |                  |             |              |        |   |
| TOL   | ±0.1        | ±0.2 | ±0.3 | ±0.5 | ±0.8 | ±1.2 |                  |             |              |        |   |
| NAMA  |             |      |      |      |      |      |                  | SKALA       | DIGAMBAR     | RIZAL  |   |
| <b>BS-9</b>   |             |      |      |      |      |      |                  | 1:2         | DIPERIKSA    |        |   |
|   |             |      |      |      |      |      |                  |             | DISAHKAN     |        |   |
| NO. ASSY : -  |             |      |      |      |      |      |                  | FORMAT      |              |        |   |
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**LAMPIRAN 5**  
**BILL OF MATERIAL**

| No     | Nama Komponen | Spesifikasi     | Satuan | Harga           | Jumlah Pemakaian per satuan |        | Harga Komponen  |
|--------|---------------|-----------------|--------|-----------------|-----------------------------|--------|-----------------|
|        |               |                 |        | per satuan      | Panjang (cm)                | Jumlah |                 |
| 1      | Plat besi     | 6 mm            | Lembar | Rp 340.000,00   | 180                         | 1      | Rp 340.000,00   |
| 2      | Plat besi     | 3 mm            | Lembar | Rp 30.000,00    | 30                          | 1      | Rp 30.000,00    |
| 3      | Plat besi     | 1 mm            | Lembar | Rp 100.000,00   | 100                         | 1      | Rp 100.000,00   |
| 4      | Plat besi     | 0,3 mm          | Lembar | Rp 30.000,00    | 60                          | 1      | Rp 30.000,00    |
| 5      | Besi hollow   | 40 x 40 x 3 mm  | Batang | Rp 160.000,00   | 600                         | 1      | Rp 160.000,00   |
| 6      | Besi hollow   | 30x 30 x 2 mm   | Batang | Rp 35.000,00    | 35                          | 1      | Rp 35.000,00    |
| 7      | Besi siku     | 40x40x3mm       | Batang | Rp 40.000,00    | 214                         | 1      | Rp 40.000,00    |
| 8      | Poros         | Ø30 mm          | Batang | Rp 60.000,00    | 30                          | 1      | Rp 60.000,00    |
| 9      | Motor AC      | 0,5 hp          | Buah   | Rp 1.100.000,00 | -                           | 1      | Rp 1.100.000,00 |
| 10     | Dimmer AC     | 220 V 6000 Watt | Buah   | Rp 90.000,00    | -                           | 1      | Rp 90.000,00    |
| 11     | Pulley        | 3 in            | Buah   | Rp 25.000,00    | -                           | 1      | Rp 25.000,00    |
| 12     | Pulley        | 4 in            | Buah   | Rp 42.000,00    | -                           | 1      | Rp 42.000,00    |
| 13     | Roller        | Ø 8 cm          | Buah   | Rp 80.000,00    | -                           | 1      | Rp 80.000,00    |
| 14     | Roller        | Ø 8 cm          | Buah   | Rp 20.000,00    | -                           | 3      | Rp 60.000,00    |
| 15     | Gas spring    | -               | Buah   | Rp 45.000,00    | -                           | 1      | Rp 45.000,00    |
| 16     | Push button   | BS216           | Buah   | Rp 35.000,00    | -                           | 1      | Rp 35.000,00    |
| 17     | Kabel         | NYM             | Meter  | Rp 8.000,00     | -                           | 3      | Rp 24.000,00    |
| 18     | Bearing       | UCFL 206 Ø 30mm | Buah   | Rp 80.000,00    | -                           | 2      | Rp 160.000,00   |
| 19     | Amplas        | -               | Buah   | Rp 50.000,00    | -                           | 1      | Rp 50.000,00    |
| 20     | Baut          | M5              | Buah   | Rp 700,00       | 3                           | 2      | Rp 1.400,00     |
| 21     | Baut          | M6              | Buah   | Rp 1.200,00     | 10                          | 3      | Rp 3.600,00     |
| 22     | Baut          | M8              | Buah   | Rp 1.000,00     | 4,5                         | 3      | Rp 3.000,00     |
| 23     | Baut          | M8              | Buah   | Rp 2.100,00     | 13                          | 3      | Rp 6.300,00     |
| 24     | Baut          | M10             | Buah   | Rp 3.100,00     | 4                           | 8      | Rp 24.800,00    |
| 25     | Baut          | M10             | Buah   | Rp 4.200,00     | 6                           | 1      | Rp 4.200,00     |
| 26     | Baut          | M14             | Buah   | Rp 4.500,00     | 4                           | 4      | Rp 18.000,00    |
| 27     | Baut          | As drat M12     | Buah   | Rp 30.000,00    | -                           | 1      | Rp 30.000,00    |
| 28     | Mur           | M5              | Buah   | Rp 300,00       | -                           | 2      | Rp 600,00       |
| 29     | Mur           | M8              | Buah   | Rp 250,00       | -                           | 3      | Rp 750,00       |
| 30     | Mur           | M10             | Buah   | Rp 250,00       | -                           | 5      | Rp 1.250,00     |
| 31     | Mur           | M12             | Buah   | Rp 500,00       | -                           | 2      | Rp 1.000,00     |
| 32     | Mur           | M14             | Buah   | Rp 1.000,00     | -                           | 4      | Rp 4.000,00     |
| 33     | Ring          | M8              | Buah   | Rp 250,00       | -                           | 3      | Rp 750,00       |
| 34     | Ring          | M10             | Buah   | Rp 250,00       | -                           | 5      | Rp 1.250,00     |
| 35     | Ring          | M12             | Buah   | Rp 500,00       | -                           | 2      | Rp 1.000,00     |
| 36     | Ring          | M14             | Buah   | Rp 1.000,00     | -                           | 4      | Rp 4.000,00     |
| 37     | Ring per      | M10             | Buah   | Rp 200,00       | -                           | 4      | Rp 800,00       |
| 38     | Rivet         | -               | Buah   | Rp 400,00       | -                           | 6      | Rp 2.400,00     |
| 39     | Cat           | Avian SB        | Buah   | Rp 35.000,00    | -                           | 2      | Rp 70.000,00    |
| 40     | E -poxy       | Dana paint      | Buah   | Rp 75.000,00    | -                           | 1      | Rp 75.000,00    |
| 41     | Dempul        | Sanpolac        | buah   | Rp 19.000,00    | -                           | 2      | Rp 38.000,00    |
| 42     | Thinner       | Impala          | Buah   | Rp 42.000,00    | -                           | 1      | Rp 42.000,00    |
| 43     | Elektroda     | RB-26           | box    | Rp 160.000,00   | -                           | 1      | Rp 160.000,00   |
| Jumlah |               |                 |        |                 |                             |        | Rp 3.000.100,00 |

**LAMPIRAN 6**  
**DOKUMENTASI**

