

## Bab III

### Kesimpulan

#### 3.1 Praktik Perancangan Bangunan Gedung (PPBG)

Pada perancangan bangunan gedung yang telah direncanakan dimulai dari struktur atas (atap, tangga, plat, balok, dan kolom) hingga perancangan struktur bawah (pondasi) dengan *output* berupa hasil design dimensi dan juga penulangan pada struktur tersebut. Dimensi struktur yang telah didesign sudah memenuhi standar SNI dan telah dilakukan pengecekan terhadap keamanannya. Lalu di dapatkan hasil perencanaan gambar dari masing-masing jenis pekerjaan yang nantinya akan dipakai di lapangan.

#### 3.2 Praktik Perancangan Jalan (PPJ)

Pada praktik perancangan jalan hasil yang telah didapatkan berupa gambar trase jalan, tipe tikungan, penentuan STA, dan perencanaan *cut and fill*. Jumlah tikungan yang dirancang berjumlah 2 tikungan dan tipe tikungan yang digunakan adalah tipe *Spiral-Circle-Spiral* sesuai dengan kriteria kontur yang ada. Pada perencanaan *cut and fill*, dapat disimpulkan bahwa pekerjaan penggalian tanah lebih banyak dari pada penimbunan dengan volume *cut* sebanyak 2599,68 m<sup>3</sup> dan volume *fill* sebanyak 2116,22 m<sup>3</sup> dimana kontur yang ada menandakan berupa perbukitan atau dataran tinggi.

#### 3.3 Praktik Perancangan Bangunan Air (PPBA)

Hasil yang didapatkan setelah melakukan perhitungan dan analisis maka diperoleh hasil perancangan Bendung Kamijoro sebagai berikut :

- Tipe bendung : Bendung tetap (badan bendung dari beton)
- Tipe Mercu : Ogee
- Tipe Kolam Olak : USBR Tipe IV
- Jumlah pintu air 2 buah dan jumlah pilar 2 buah
- Bendung Kamijoro yang telah dirancang telah aman terhadap guling, geser, angkat, daya dukung tanah dan gempa.

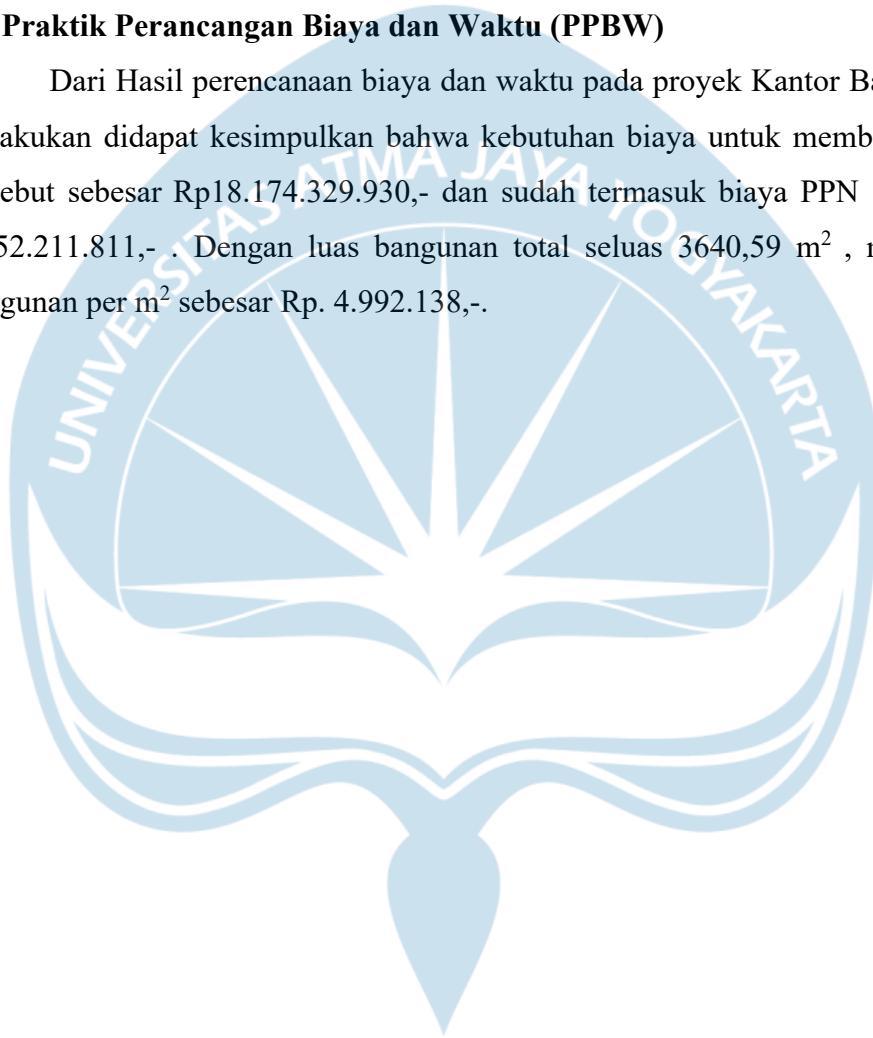
Dengan dimensi bendungan sebagai berikut :

|                      |           |
|----------------------|-----------|
| Elevasi dasar sungai | = 100 m   |
| Tinggi bendung       | = 2,4 m   |
| h1                   | = 1,276 m |
| $\Delta H$           | = 4,1     |
| m (kemiringan)       | = 1       |

|                                  |              |
|----------------------------------|--------------|
| b (lebar) mercu                  | = 82.66 m    |
| b (lebar) sungai                 | = 88.44 m    |
| Elevasi dasar kolam olak         | = 98,3 m     |
| Elevasi yang diharapkan di hilir | = 100.7642 m |
| Elevasi mercu bendung            | = 102.4 m    |

### 3.4 Praktik Perancangan Biaya dan Waktu (PPBW)

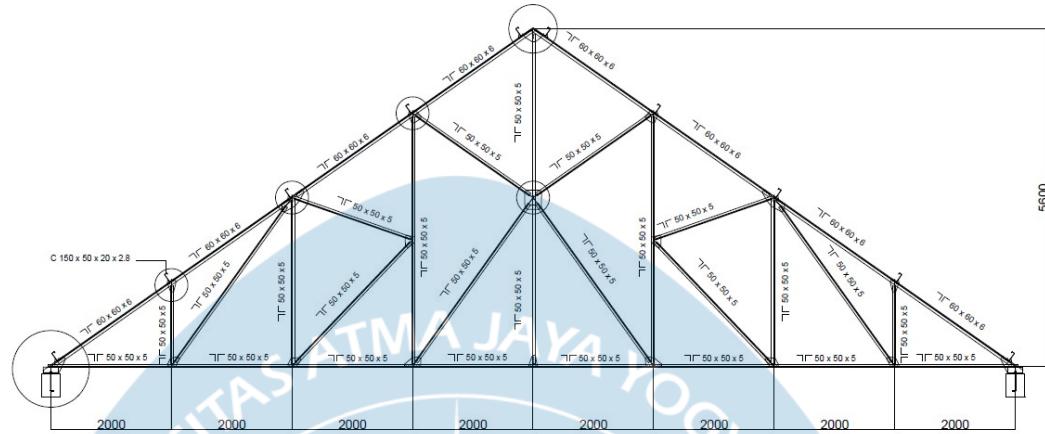
Dari Hasil perencanaan biaya dan waktu pada proyek Kantor Bapeda yang telah di lakukan didapat kesimpulan bahwa kebutuhan biaya untuk membangun bangunan tersebut sebesar Rp18.174.329.930,- dan sudah termasuk biaya PPN 10% sebesar Rp 1.652.211.811,- . Dengan luas bangunan total seluas 3640,59 m<sup>2</sup> , maka harga luas bangunan per m<sup>2</sup> sebesar Rp. 4.992.138,-.



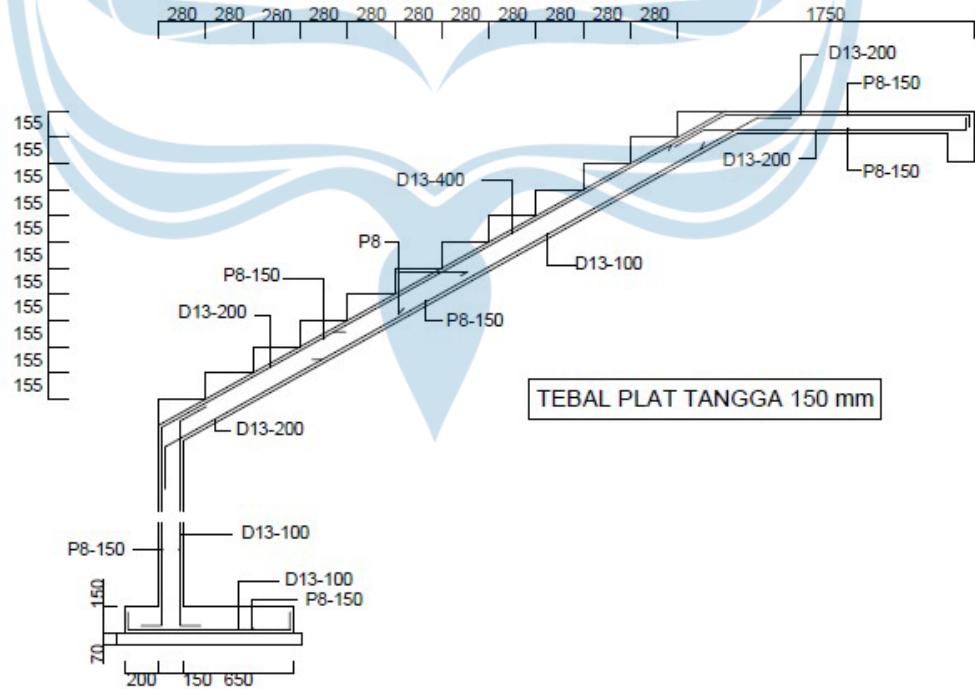
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- 7.

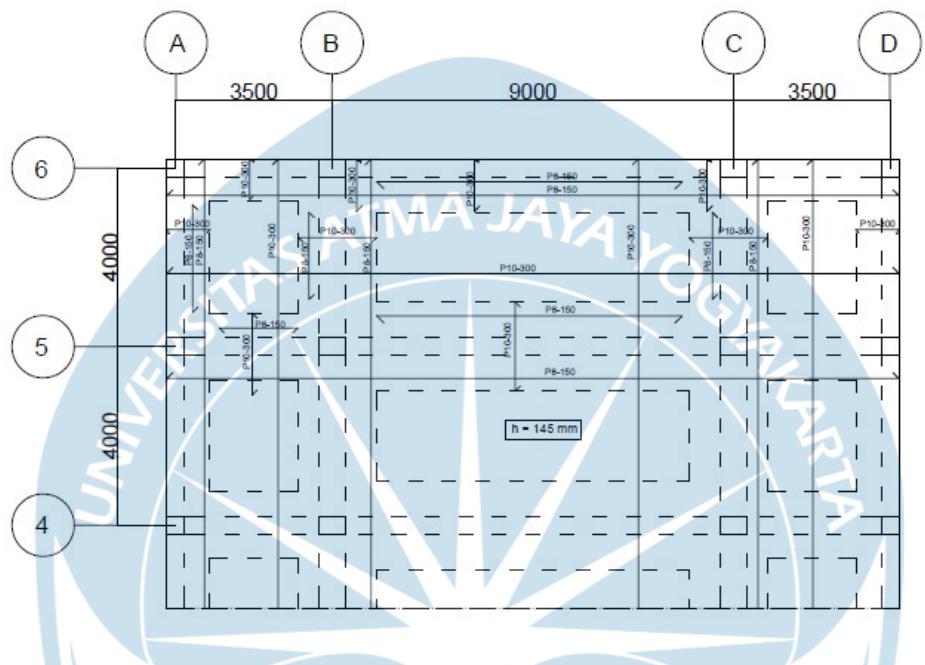
## LAMPIRAN



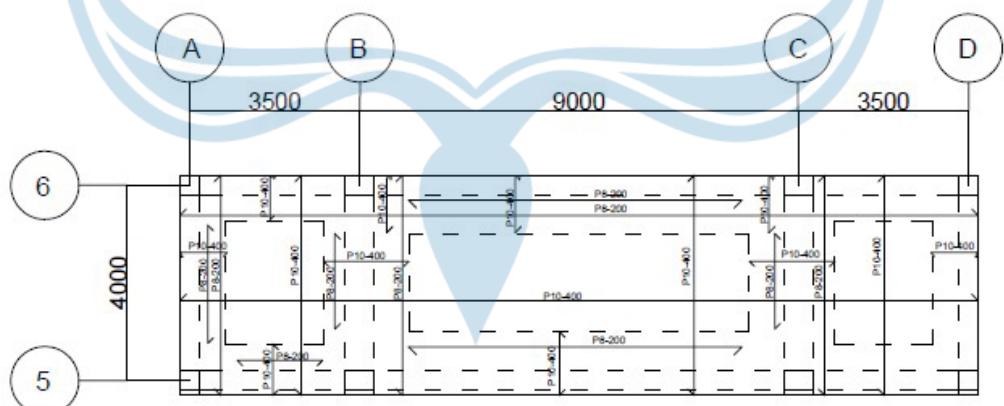
Lampiran 2.1 Hasil Perancangan Kuda-Kuda



Lampiran 2.2 Hasil Perancangan Tangga

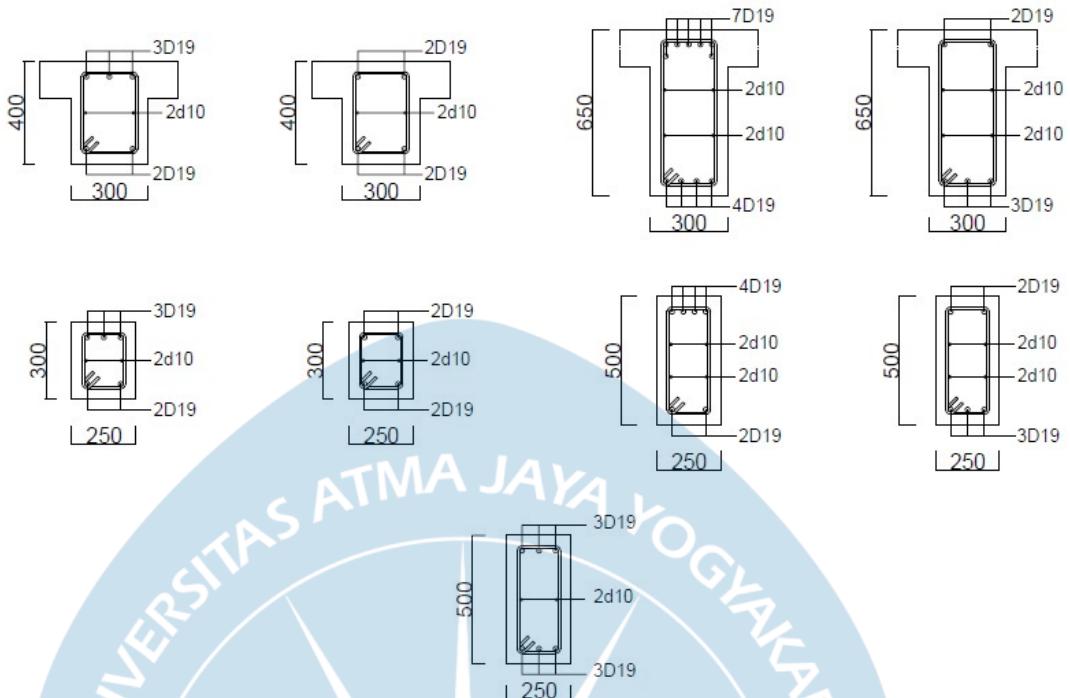


Denah Rencana Penulangan Plat Lantai

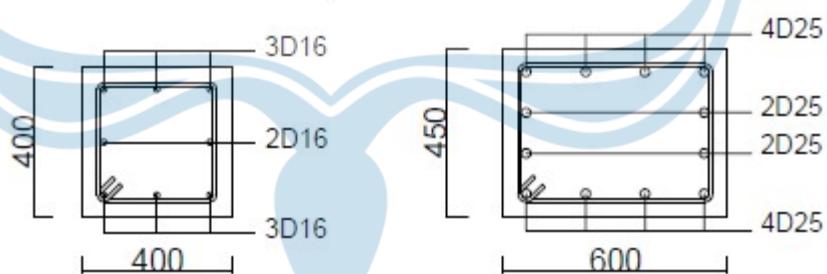


Denah Rencana Penulangan Plat Atap

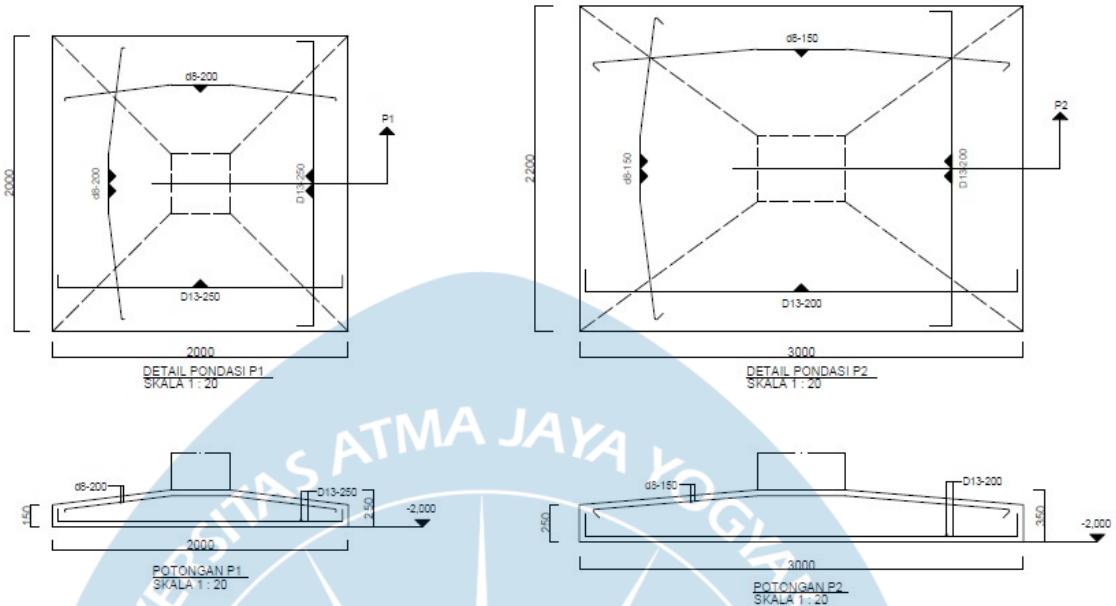
Lampiran 2.3 Hasil Perancangan Plat Lanti dan Plat Atap



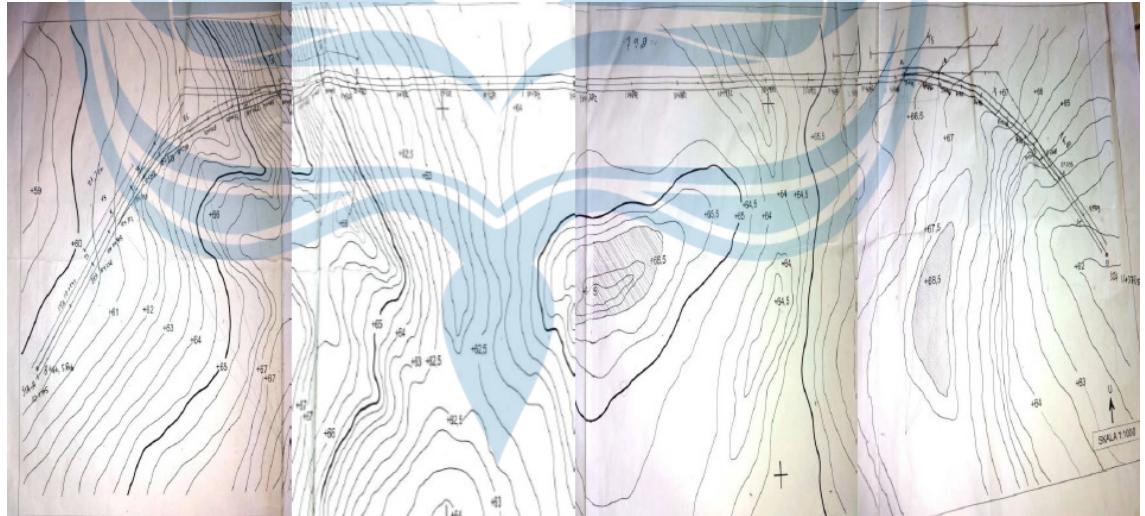
Lampiran 2.4 Hasil Perancangan Balok dan Sloof



Lampiran 2.5 Hasil Perancangan Kolom



Lampiran 2.6 Hasil Perancangan Pondasi



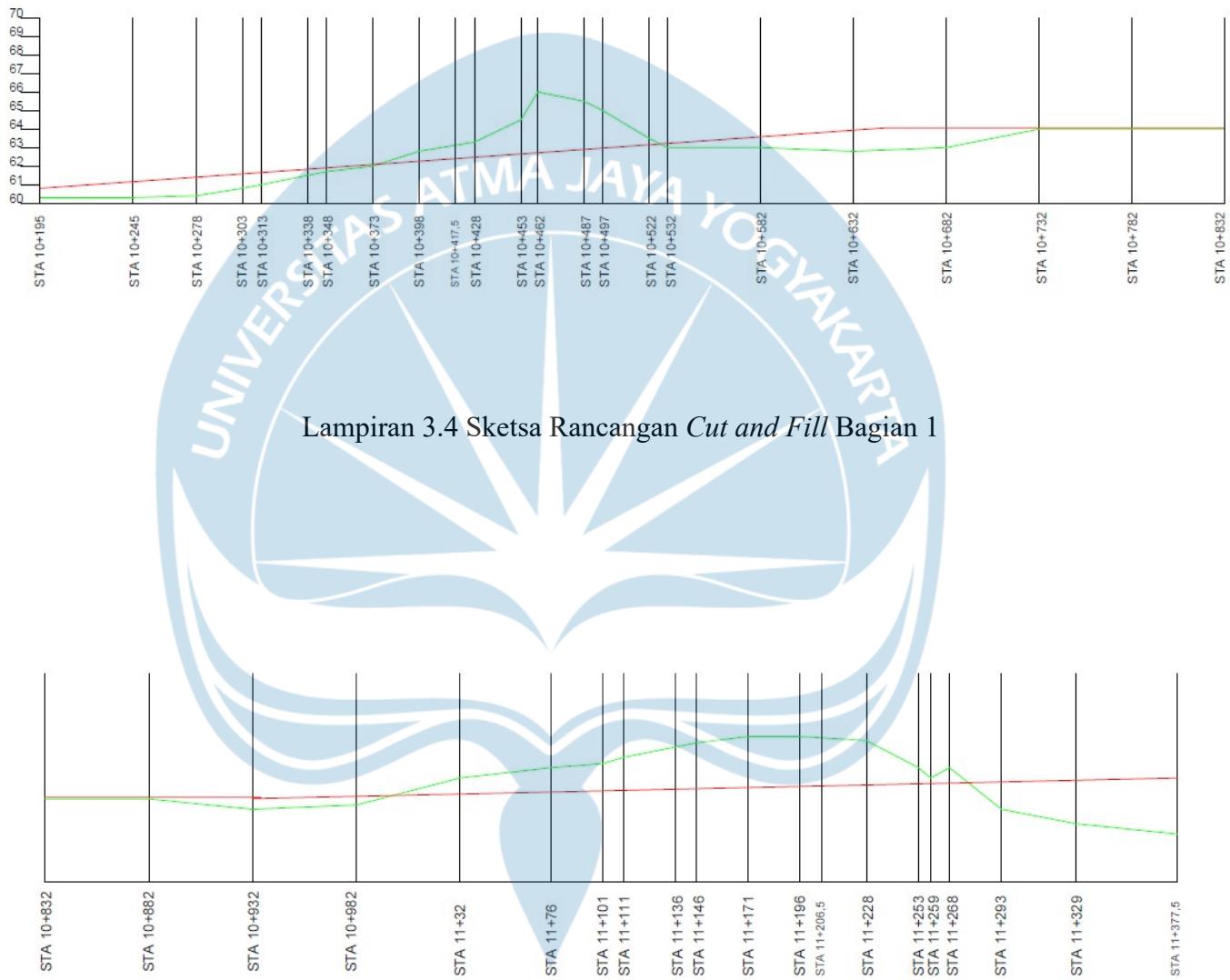
Lampiran 3.1 Hasil Perancangan Trase Jalan dan STA

| No |    | Titik       | elevasi |       |       | Rancangan Elevasi |        |       | Panjang Jalan | Bahu Jalan | Kedalaman Drainase |        |
|----|----|-------------|---------|-------|-------|-------------------|--------|-------|---------------|------------|--------------------|--------|
|    |    |             |         | Kiri  | Cl    | Kanan             | Kiri   | Cl    | Kanan         |            |                    |        |
| 1  | A  | 1 STA 10 +  | 195     | 60,25 | 60,3  | 60,35             | 60,725 | 60,8  | 60,725        | 0          | 60,625             | 59,625 |
| 2  |    | 2 STA 10 +  | 245     | 60,2  | 60,25 | 60,3              | 61,035 | 61,11 | 61,035        | 50         | 60,935             | 59,935 |
| 3  | TS | 3 STA 10 +  | 278     | 60,25 | 60,3  | 60,35             | 61,225 | 61,3  | 61,225        | 33         | 61,125             | 60,125 |
| 4  |    | 4 STA 10 +  | 303     | 60,75 | 60,8  | 60,85             | 61,505 | 61,58 | 61,505        | 25         | 61,405             | 60,405 |
| 5  |    | 5 STA 10 +  | 313     | 60,95 | 61    | 61,5              | 61,575 | 61,65 | 61,575        | 10         | 61,475             | 60,475 |
| 6  |    | 6 STA 10 +  | 338     | 61,45 | 61,5  | 61,55             | 61,425 | 61,5  | 61,425        | 25         | 61,325             | 60,325 |
| 7  | SC | 7 STA 10 +  | 348     | 61,45 | 61,75 | 62,2              | 61,675 | 61,75 | 61,675        | 10         | 61,575             | 60,575 |
| 8  |    | 8 STA 10 +  | 373     | 61,75 | 62    | 62,3              | 61,925 | 62    | 61,925        | 25         | 61,825             | 60,825 |
| 9  |    | 9 STA 10 +  | 398     | 62,6  | 62,75 | 63                | 62,135 | 62,21 | 62,135        | 25         | 62,035             | 61,035 |
| 10 | 1  | 10 STA 10 + | 411,5   | 63    | 63,1  | 63,25             | 62,205 | 62,28 | 62,205        | 13,5       | 62,105             | 61,105 |
| 11 |    | 11 STA 10 + | 428     | 63,25 | 63,27 | 63,3              | 61,355 | 61,43 | 61,355        | 16,5       | 61,255             | 60,255 |
| 12 |    | 12 STA 10 + | 453     | 64,4  | 64,4  | 64,4              | 61,045 | 61,12 | 61,045        | 25         | 60,945             | 59,945 |
| 13 |    | 13 STA 10 + | 462     | 66,3  | 66    | 65,5              | 63,325 | 63,4  | 63,325        | 9          | 63,225             | 62,225 |
| 14 | CS | 14 STA 10 + | 487     | 65,4  | 65,5  | 65,7              | 63,395 | 63,47 | 63,395        | 25         | 63,295             | 62,295 |
| 15 |    | 15 STA 10 + | 497     | 64,7  | 64,8  | 65                | 64,725 | 64,8  | 64,725        | 10         | 64,625             | 63,625 |
| 16 |    | 16 STA 10 + | 522     | 63,25 | 63,4  | 63,5              | 63,545 | 63,62 | 63,545        | 25         | 63,445             | 62,445 |
| 17 | ST | 17 STA 10 + | 532     | 62,9  | 63,1  | 63,2              | 63,605 | 63,68 | 63,605        | 10         | 63,505             | 62,505 |
| 18 |    | 18 STA 10 + | 582     | 63    | 62,9  | 62,8              | 63,965 | 64,04 | 63,965        | 50         | 63,865             | 62,865 |
| 19 |    | 19 STA 10 + | 632     | 62,8  | 62,75 | 62,7              | 63,745 | 63,82 | 63,745        | 50         | 63,645             | 62,645 |
| 20 |    | 20 STA 10 + | 682     | 63,3  | 63,3  | 63,3              | 63,295 | 63,37 | 63,295        | 50         | 63,195             | 62,195 |
| 21 |    | 21 STA 10 + | 732     | 64    | 64    | 64                | 63,995 | 64,07 | 63,995        | 50         | 63,895             | 62,895 |
| 22 |    | 22 STA 10 + | 782     | 64    | 64    | 64                | 63,995 | 64,07 | 63,995        | 50         | 63,895             | 62,895 |
| 23 |    | 23 STA 10 + | 832     | 64    | 64    | 64                | 63,995 | 64,07 | 63,995        | 50         | 63,895             | 62,895 |
| 24 |    | 24 STA 10 + | 882     | 64    | 64    | 64                | 63,925 | 64    | 63,925        | 50         | 63,825             | 62,825 |
| 25 |    | 25 STA 10 + | 932     | 63,4  | 63,5  | 63,55             | 63,425 | 63,5  | 63,425        | 50         | 63,325             | 62,325 |
| 26 |    | 26 STA 10 + | 982     | 63,8  | 63,7  | 63,6              | 62,855 | 62,93 | 62,855        | 50         | 62,755             | 61,755 |
| 27 |    | 27 STA 11 + | 32      | 64,75 | 64,75 | 64,75             | 63,505 | 63,58 | 63,505        | 50         | 63,405             | 62,405 |
| 28 | TS | 28 STA 11 + | 76      | 65,25 | 65,3  | 65,35             | 63,905 | 63,98 | 63,905        | 44         | 63,805             | 62,805 |
| 29 |    | 29 STA 11 + | 101     | 65,75 | 65,8  | 65,85             | 64,135 | 64,21 | 64,135        | 25         | 64,035             | 63,035 |
| 30 |    | 30 STA 11 + | 111     | 65,8  | 66    | 66,15             | 63,885 | 63,96 | 63,885        | 10         | 63,785             | 62,785 |
| 31 |    | 31 STA 11 + | 136     | 66,4  | 66,5  | 66,6              | 64,205 | 64,28 | 64,205        | 25         | 64,105             | 63,105 |
| 32 | SC | 32 STA 11 + | 146     | 66,5  | 66,6  | 66,75             | 64,065 | 64,14 | 64,065        | 10         | 63,965             | 62,965 |
| 33 |    | 33 STA 11 + | 171     | 67,1  | 67,2  | 67,2              | 64,725 | 64,8  | 64,725        | 25         | 64,625             | 63,625 |
| 34 |    | 34 STA 11 + | 196     | 67    | 67    | 67                | 64,795 | 64,87 | 64,795        | 25         | 64,695             | 63,695 |
| 35 | 2  | 35 STA 11 + | 206,5   | 67    | 67    | 67                | 66,155 | 66,23 | 66,155        | 10,5       | 66,055             | 65,055 |
| 36 |    | 36 STA 11 + | 228     | 66,75 | 66,75 | 66,6              | 66,415 | 66,49 | 66,415        | 21,5       | 66,315             | 65,315 |
| 37 |    | 37 STA 11 + | 253     | 65,75 | 66,5  | 66,25             | 65,685 | 65,76 | 65,685        | 25         | 65,585             | 64,585 |
| 38 | CS | 38 STA 11 + | 259     | 65    | 64,9  | 64,6              | 63,515 | 63,59 | 63,515        | 6          | 63,415             | 62,415 |
| 39 |    | 39 STA 11 + | 268     | 64,6  | 64,5  | 64,4              | 62,335 | 62,41 | 62,335        | 9          | 62,235             | 61,235 |
| 40 |    | 40 STA 11 + | 293     | 63,7  | 63,65 | 63,6              | 60,875 | 60,95 | 60,875        | 25         | 60,775             | 59,775 |
| 41 | ST | 41 STA 11 + | 329     | 62,75 | 62,7  | 62,6              | 62,625 | 62,7  | 62,625        | 36         | 62,525             | 61,525 |
| 42 | B  | 42 STA 11 + | 377,5   | 62,3  | 62,25 | 62,2              | 62,175 | 62,25 | 62,175        | 48,5       | 62,075             | 61,075 |

Lampiran 3. 2 Hasil Perancangan Rencana Elevasi

| No |    | Panjang | Fill   |      |        | Cut    |      |       | Luas Fill | Luas Cut   | Volume Fill | Volume Cut |
|----|----|---------|--------|------|--------|--------|------|-------|-----------|------------|-------------|------------|
|    |    |         | Jalan  | Kiri | Cl     | Kanan  | Kiri | Cl    |           |            |             |            |
| 1  | A  | 0       | 0,475  | 0,5  | 0,375  |        |      |       | 1,734375  |            |             |            |
| 2  |    | 50      | 0,835  | 0,86 | 0,735  |        |      |       | 3,084375  |            | 240,9375    |            |
| 3  | TS | 33      | 0,975  | 1    | 0,875  |        |      |       | 3,609375  |            | 159,84375   |            |
| 4  |    | 25      | 0,755  | 0,78 | 0,655  |        |      |       | 2,784375  |            |             |            |
| 5  |    | 10      | 0,625  | 0,65 | 0,075  |        |      |       | 1,875     |            | 58,828125   |            |
| 6  |    | 25      | -0,025 | 0,33 | -0,125 |        |      |       | 0,478125  |            |             |            |
| 7  | SC | 10      | 0,225  | 0,2  | -0,525 |        |      |       | 0,09375   |            | 1,40625     |            |
| 8  |    | 25      | 0,175  | 0,08 | -0,375 |        | 0    |       | -0,0375   |            |             |            |
| 9  |    | 25      |        | 0    |        | 0,465  | 0,54 | 0,865 |           | 2,259375   |             | 72,0140625 |
| 10 | 1  | 13,5    |        |      |        | 0,795  | 0,72 | 1,045 |           | 3,075      |             |            |
| 11 |    | 16,5    |        |      |        | 0,795  | 0,82 | 1,045 |           | 3,2625     |             | 257,8125   |
| 12 |    | 25      |        |      |        | 1,895  | 1,84 | 1,945 |           | 7,05       |             |            |
| 13 |    | 9       |        |      |        | 3,355  | 3,28 | 3,355 |           | 12,440625  |             | 553,59375  |
| 14 | CS | 25      |        |      |        | 2,975  | 2,6  | 2,175 |           | 9,703125   |             |            |
| 15 |    | 10      |        |      |        | 2,005  | 2,03 | 2,305 |           | 7,846875   |             | 218,4375   |
| 16 |    | 25      |        | 0    |        | -0,025 | 0,35 | 0,275 |           | 0,890625   |             |            |
| 17 | ST | 10      | 0,295  | 0,22 | 0,045  |        | 0    |       | 0,73125   |            | 142,96875   |            |
| 18 |    | 50      | 0,705  | 0,58 | 0,405  |        |      |       | 2,128125  |            |             |            |
| 19 |    | 50      | 0,965  | 1,14 | 1,165  |        |      |       | 4,134375  |            | 400,3125    |            |
| 20 |    | 50      | 0,945  | 1,07 | 1,045  |        |      |       | 3,871875  |            |             |            |
| 21 |    | 50      | -0,005 | 0,07 | -0,005 |        |      |       | 0,121875  |            | 12,1875     |            |
| 22 |    | 50      | -0,005 | 0,07 | -0,005 |        |      |       | 0,121875  |            |             |            |
| 23 |    | 50      | -0,005 | 0,07 | -0,005 |        |      |       | 0,121875  |            | 12,1875     |            |
| 24 |    | 50      | -0,005 | 0,07 | -0,005 |        |      |       | 0,121875  |            |             |            |
| 25 |    | 50      | -0,075 | 0,57 | -0,075 |        |      |       | 0,928125  |            | 81,09375    |            |
| 26 |    | 50      | 0,025  | 0,42 | -0,125 |        | 0    |       | 0,69375   |            |             |            |
| 27 |    | 50      |        | 0    |        | 0,945  | 0,77 | 0,745 |           | 3,028125   |             | 332,475    |
| 28 | TS | 44      |        |      |        | 1,245  | 1,17 | 1,245 |           | 4,528125   |             |            |
| 29 |    | 25      |        |      |        | 1,345  | 1,32 | 1,445 |           | 5,090625   |             | 111,9375   |
| 30 |    | 10      |        |      |        | 1,615  | 1,59 | 1,715 |           | 6,103125   |             |            |
| 31 |    | 25      |        |      |        | 1,915  | 2,04 | 2,265 |           | 7,74375    |             | 162,09375  |
| 32 | SC | 10      |        |      |        | 2,195  | 2,22 | 2,395 |           | 8,465625   |             |            |
| 33 |    | 25      |        |      |        | 2,435  | 2,46 | 2,685 |           | 9,4125     |             | 461,484375 |
| 34 |    | 25      |        |      |        | 2,375  | 2,4  | 2,475 |           | 9,046875   |             |            |
| 35 | 2  | 10,5    |        |      |        | 2,205  | 2,3  | 2,205 |           | 8,446875   |             | 356,3625   |
| 36 |    | 21,5    |        |      |        | 2,205  | 2,13 | 2,205 |           | 8,128125   |             |            |
| 37 |    | 25      |        |      |        | 0,845  | 0,77 | 0,845 |           | 3,028125   |             | 24,01875   |
| 38 | CS | 6       |        |      |        | 0,335  | 0,26 | 0,185 |           | 0,975      |             |            |
| 39 |    | 9       |        | 0    |        | 0,065  | 0,74 | 0,565 |           | 1,978125   |             | 121,640625 |
| 40 |    | 25      | 1,485  | 1,31 | 1,085  |        | 0    |       | 4,865625  |            |             | 49,453125  |
| 41 | ST | 36      | 2,265  | 2,09 | 2,065  |        |      |       | 7,978125  |            | 884,821875  |            |
| 42 | B  | 48,5    | 2,825  | 2,7  | 2,725  |        |      |       | 10,265625 |            |             |            |
|    |    |         |        |      |        |        |      |       | Total     | 2116,22812 | 2599,682813 |            |

Lampiran 3.3 Hasil Perancangan *Cut and Fill*



Lampiran 3.5 Sketsa Rancangan *Cut and Fill* Bagian 2

| Tahun | Tempat, tgl | Sapon | seyegan | badran | genbongan | kenteng | kalibawang | godean | CH rerata |     |
|-------|-------------|-------|---------|--------|-----------|---------|------------|--------|-----------|-----|
| 1993  | 23 des      | 91    | 30      | 0      | 8         | 113     | 11         | 27     | 11,35678  |     |
|       | 3 mei       | 0     | 120     | 20     | 40        | 185     | 0          | 0      | 25,6091   |     |
|       | 04-Mar      | 0     | 5       | 93     | 0         | 0       | 0          | 0      | 53,98942  | MAX |
|       | 24 des      | 20    | 35      | 13     | 134       | 17      | 28         | 41     | 21,19841  |     |
|       | 3 mei       | 0     | 120     | 20     | 40        | 185     | 0          | 0      | 25,6091   |     |
|       | 16-Apr      | 0     | 17      | 25     | 0         | 0       | 80         | 12     | 38,2462   |     |
|       | 8 des       | 56    | 45      | 0      | 3         | 51      | 0          | 96     | 7,446843  |     |
|       |             |       |         |        |           |         |            |        |           |     |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | gendongan | kenteng | kalibawang | godean |           |     |
| 1994  | 18-Feb      | 82    | 0       | 30     | 0         | 3,9     | 14,2       | 0      | 21,7091   |     |
|       | 27-Jan      | 0     | 115     | 50     | 4         | 3,2     | 3,5        | 46     | 34,70102  |     |
|       | 14-Jan      | 0     | 10      | 63     | 5         | 1,3     | 11         | 26     | 40,9693   |     |
|       | 15-Nov      | 0,8   | 0,8     | 0      | 83        | 7       | 0          | 0      | 1,876654  |     |
|       | 23-Mar      | 14,8  | 30      | 30     | 4         | 79,2    | 2,1        | 17     | 23,82721  |     |
|       | 08-Mar      | 0     | 0       | 31     | 39        | 46      | 86,5       | 9      | 46,31151  | MAX |
|       | 10-Mar      | 0     | 25      | 29     | 2         | 31,8    | 6,9        | 84     | 24,17583  |     |
|       |             |       |         |        |           |         |            |        |           |     |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | gendongan | kenteng | kalibawang | godean |           |     |
| 1995  | 7 des       | 177,5 | 25      | 0      | 11,7      | 0       | 19,5       | 65     | 8,815532  |     |
|       | 26-Nov      | 3,3   | 50      | 18     | 1,4       | 0       | 2,6        | 92     | 15,69359  |     |
|       | 16-Nov      | 0,5   | 35      | 51     | 0,8       | 5,4     | 8,5        | 69     | 35,60015  |     |
|       | 04-Feb      | 8     | 38,3    | 0      | 138       | 19,4    | 0          | 59     | 6,563335  |     |
|       | 03-Feb      | 11,2  | 6,3     | 0      | 13        | 34      | 8,5        | 0      | 4,72667   |     |
|       | 20-Jan      | 36,6  | 63,4    | 11     | 5         | 3,4     | 135,5      | 43     | 48,58786  | MAX |
|       | 26-Nov      | 3,3   | 50      | 18     | 1,4       | 0       | 2,6        | 92     | 15,69359  |     |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | genbongan | kenteng | kalibawang | godean | CH rerata |     |
| 1996  | 23-Jan      | 16    | 0       | 55     | 14        | 0       | 10         | 32     | 36,1079   | MAX |
|       | 11 Des      | 57    | 15      | 3      | 54        | 35      | 40         | 96     | 19,9044   |     |
|       | 9 Okt       | 27    | 25      | 0      | 32        | 69      | 29         | 0      | 13,3644   |     |
|       | -           | -     | -       | -      | -         | -       | -          | -      | -         |     |
|       | 01-Nov      | 18    | 75      | 0      | 16        | 5       | 37         | 0      | 13,0397   |     |
|       | 13 Des      | 24    | 75      | 6      | 24        | 25      | 42         | 0      | 19,2088   |     |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | gendongan | kenteng | kalibawang | godean |           |     |
| 1997  | 12 Des      | 7     | 17      | 61     | 2         | 9       | 59         | 0      | 53,1987   |     |
|       | 13-Feb      | 116   | 65      | 5      | 160       | 25      | 255        | 0      | 81,8566   |     |
|       | 16-Jan      | 24    | 65      | 0      | 12        | 4       | 81         | 51     | 27,0756   |     |
|       | 28-Feb      | 36    | 45      | 0      | 36        | 3       | 55         | 51     | 19,5037   |     |
|       | 03-Feb      | 30    | 0       | 9      | 11        | 5       | 452        | 13     | 135,655   | MAX |
|       | 05-Jan      | 26    | 25      | 9      | 22        | 50      | 56         | 16     | 25,6396   |     |
|       |             |       |         |        |           |         |            |        |           |     |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | gendongan | kenteng | kalibawang | godean |           |     |
| 1998  | 17-Jan      | 18    | 7       | 75     | 8         | 20      | 0          | 6      | 45,0943   | MAX |
|       | 16-Jun      | 0     | 14      | 72     | 105       | 7       | 0          | 15     | 44,8253   |     |
|       | 21 Des      | 0     | 69      | 3      | 29        | 52      | 9          | 103    | 13,0903   |     |
|       | 14-Jun      | 0     | 21      | 5      | 0         | 0       | 85         | 0      | 27,7703   |     |
|       | 03 Aprl     | 0     | 10      | 17     | 13        | 70      | 6          | 0      | 15,9527   |     |
|       | 31 Des      | 92    | 31      | 0      | 58        | 39      | 25         | 28     | 12,1788   |     |
|       |             |       | -       |        |           |         |            |        |           |     |

| Tahun | Tempat, tgl | Sapon | seyegan     | badran | genbongan | kenteng  | kalibawang | godean   | CH rerata    |
|-------|-------------|-------|-------------|--------|-----------|----------|------------|----------|--------------|
| 1999  | 02-Jan      | 128   | 941,9717552 | 12     | 51        | 4        | 55,1       | 86       | 50,42868     |
|       |             |       |             |        |           |          |            |          |              |
|       | 21-Des      | 0     | 0,815921412 | 75     | 1         | 0        | 3          | 0        | 44,33689     |
|       | 28-Feb      | 91,3  | 825,9082738 | 21     | 109       | 1852,221 | 10         | 60       | 143,1251 MAX |
|       | 16-Apr      | 60,5  | 456,1348903 | 5      | 53        | 58       | 68,3       | 35       | 39,26765     |
|       | 27-Feb      | 0     | 25,37629194 | 27     | 44        | 56,91007 | 84         | 80       | 47,11732     |
|       | 14-Mar      | 5,4   | 75,66307029 | 5      | 97        | 47       | 0,5        | 90       | 12,44446     |
|       |             |       |             |        |           |          |            |          |              |
| Tahun | Tempat, tgl | Sapon | seyegan     | badran | gendongan | kenteng  | kalibawang | godean   |              |
| 2000  | 16-Apr      | 120   | 863,1040064 | 0      | 0         | 0        | 4          | 15       | 23,23724     |
|       |             |       |             |        |           |          |            |          |              |
|       | 05-Jan      | 26,4  | 193,3342507 | 59     | 6         | 0,3      | 0          | 17       | 39,72528     |
|       | 25-Feb      | 0     | 22,75063924 | 6      | 85        | 25       | 60         | 0        | 24,12763     |
|       | 12-Mar      | 40    | 291,3353526 | 33     | 0         | 53       | 4,5        | 0        | 30,63977     |
|       | 21-Nov      | 10,3  | 92,48387848 | 19     | 0         | 0,5      | 205        | 131,2703 | 76,7108 MAX  |
|       | 05-Feb      | 3,3   | 53,84248729 | 9      | 74        | 28,7     | 16         | 88       | 17,15854     |
|       |             |       |             |        |           |          |            |          |              |
| Tahun | Tempat, tgl | Sapon | seyegan     | badran | gendongan | kenteng  | kalibawang | godean   |              |
| 2001  | 29-Jan      | 113   | 0           | 9      | 1         | 1,5      | 8,5        | 0        | 7,814631     |
|       | 23-Nov      | 0     | 95          | 0      | 18        | 27       | 0          | 43       | 5,710876     |
|       | 15-Jul      | 82,5  | 2           | 93     | 79,5      | 18       | 0          | 0        | 56,37118 MAX |
|       | 30-Jan      | 0     | 5           | 1      | 119       | 52,3     | 4          | 26       | 7,79012      |
|       | 21-Jan      | 11,9  | 4           | 0      | 2         | 187      | 6,6        | 23       | 13,28817     |
|       | 20-Okt      | 33    | 3           | 27     | 0         | 0,8      | 105        | 13       | 46,31725     |
|       | 16-Nov      | 0     | 15          | 33     | 5         | 29       | 3          | 108      | 25,87115     |
|       |             |       |             |        |           |          |            |          |              |
| Tahun | Tempat, tgl | Sapon | seyegan     | badran | genbongan | kenteng  | kalibawang | godean   | CH rerata    |
| 2002  | 16 Mei      | 0     | 1           | 59     | 0         | 0        | 0          | 1        | 34,23261     |
|       | 14-Feb      | 10    | 43          | 2      | 95        | 22       | 50         | 41       | 20,9141      |
|       |             |       |             |        |           |          |            |          |              |
|       | 25 Des      | 39    | 75          | 0      | 4         | 0        | 130        | 59       | 41,28927 MAX |
|       | 31-Mar      | 6     | 35          | 23     | 19        | 67       | 30         | 35       | 28,10498     |
|       | 01-Jan      | 91    | 23          | 0      | 72        | 28       | 0          | 32       | 4,591093     |
|       | 13 Des      | 24    | 75          | 6      | 24        | 25       | 42         | 0        | 19,20882     |
|       |             |       |             |        |           |          |            |          |              |
| Tahun | Tempat, tgl | Sapon | seyegan     | badran | gendongan | kenteng  | kalibawang | godean   |              |
| 2003  | 03-Jan      | 61    | 5           | 55     | 8         | 14       | 63         | 0        | 50,98709 MAX |
|       | 02-Feb      | 0     | 0           | 3      | 135       | 7        | 0          | 0        | 4,511912     |
|       | 27-Feb      | 17    | 94          | 19     | 100       | 59       | 15         | 78       | 25,46949     |
|       | 08-Mar      | 19    | 50          | 11     | 0         | 0        | 115        | 0        | 40,57312     |
|       | 04-Jan      | 16    | 100         | 0      | 89        | 78       | 36         | 72       | 21,28463     |
|       | 05-Mar      | 111   | 20          | 13     | 21        | 40       | 56         | 27       | 27,69372     |
|       | 04-Jan      | 16    | 100         | 0      | 89        | 78       | 36         | 72       | 21,28463     |
|       |             |       |             |        |           |          |            |          |              |
| Tahun | Tempat, tgl | Sapon | seyegan     | badran | gendongan | kenteng  | kalibawang | godean   |              |
| 2004  | 13-Mar      | 0     | 9           | 48     | 13        | 16       | 0          | 17       | 29,7492      |
|       | 4 Des       | 0     | 28          | 7      | 76        | 18       | 0          | 115      | 11,16302     |
|       | 29 Feb      | 0     | 3           | 2      | 3         | 0        | 0          | 263      | 10,58139     |
|       | 27 Des      | 27    | 20          | 0      | 8         | 0        | 113        | 63       | 35,25452 MAX |
|       | 28 Des      | 8     | 48          | 0      | 28        | 48       | 9          | 104      | 10,62877     |
|       | 25 Des      | 107   | 0           | 9      | 0         | 0        | 50         | 0        | 19,59895     |
|       | 05-Feb      | 0     | 109         | 0      | 1         | 0        | 0,5        | 21       | 3,617271     |

| Tahun | Tempat, tgl | Sapon | seyegan | badran | genbongan | kenteng | kalibawang | godean | CH rerata    |
|-------|-------------|-------|---------|--------|-----------|---------|------------|--------|--------------|
| 2005  | 11 Des      | 116   | 28,5    | 0      | 2         | 27      | 0          | 53     | 4,193018     |
|       | 10- Feb     | 18,7  | 116,7   | 19     | 12        | 19      | 10         | 22     | 18,83667     |
|       | 5 Mei       | 0     | 0       | 86     | 0         | 0       | 0          | 0      | 49,81057 MAX |
|       | 17 Des      | 90,8  | 50      | 13     | 121       | 126     | 38         | 62     | 31,07733     |
|       | 17 Des      | 90,8  | 50      | 13     | 121       | 126     | 38         | 62     | 31,07733     |
|       | 20 Apr      | 0     | 2       | 0      | 0         | 0       | 47         | 0      | 13,51468     |
|       | 22 Feb      | 0     | 0       | 0      | 2         | 2       | 2          | 64     | 2,981952     |
|       |             |       |         |        |           |         |            |        |              |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | gendongan | kenteng | kalibawang | godean |              |
| 2006  | 13 Des      | 121,5 | 51      | 0      | 54        | 0       | 65         | 0      | 20,9152      |
|       | 8 Des       | 0,2   | 57,5    | 0      | 0         | 52      | 24         | 69     | 13,65012     |
|       | 6 Mei       | 3,4   | 12      | 70     | 10        | 0       | 16         | 17     | 46,20544 MAX |
|       | 20 Mar      | 83,7  | 43      | 2,1    | 88        | 0       | 28         | 48     | 13,60719     |
|       | 8 Des       | 0,2   | 57,5    | 0      | 0         | 52      | 24         | 69     | 13,65012     |
|       | 19 Feb      | 55,5  | 55      | 2      | 27        | 0       | 104        | 0      | 32,83133     |
|       | 12 Des      | 6,2   | 1       | 0      | 0         | 0       | 56         | 70     | 18,54579     |
|       |             |       |         |        |           |         |            |        |              |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | gendongan | kenteng | kalibawang | godean |              |
| 2007  | 23 Mar      | 102   | 21      | 0      | 102       | 31      | 4          | 6      | 5,47185      |
|       | 14 Apr      | 0     | 91      | 0,6    | 0         | 9       | 43         | 0      | 15,43499     |
|       | 2 Apr       | 22    | 10,5    | 119,7  | 22        | 19      | 7          | 0      | 73,05838 MAX |
|       | 23 Mar      | 102   | 21      | 0      | 102       | 31      | 4          | 6      | 5,47185      |
|       | 28 Des      | 70    | 0,5     | 10,6   | 70        | 67      | 48         | 0      | 24,92108     |
|       | 30 Jan      | 1     | 0       | 18,3   | 1         | 13      | 96         | 0      | 38,84616     |
|       | 20 Mar      | 0     | 0       | 37,9   | 0         | 9       | 32         | 67     | 33,98958     |
|       |             |       |         |        |           |         |            |        |              |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | genbongan | kenteng | kalibawang | godean |              |
| 2008  | 4 Januari   | 90    | 15      | 10,7   | 16        | 23,3    | 9          | 0      | 10,78492     |
|       | 4 Februari  | 46    | 85,5    | 31,6   | 0         | 13      | 56,8       | 0      | 37,4565      |
|       | 27 oktober  | 3     | 21      | 87,2   | 32        | 6       | 0          | 0      | 51,93027 MAX |
|       | 22 Nopember | 61,5  | 58,5    | 0      | 128       | 84      | 15         | 0      | 12,74021     |
|       | 22 Nopember | 61,5  | 58,5    | 0      | 128       | 84      | 15         | 0      | 12,74021     |
|       | 24 Nopember | 21,8  | 45      | 5,8    | 4         | 0       | 80,5       | 0      | 27,62526     |
|       | 26 januari  | 19,2  | 11,7    | 4,1    | 10        | 8,5     | 6          | 71,5   | 7,574325     |
|       |             |       |         |        |           |         |            |        |              |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | gendongan | kenteng | kalibawang | godean |              |
| 2009  | 1 Februari  | 95    | 4       | 4,3    | 40,16921  | 0       | 14         | 0      | 7,365067     |
|       | 27 February | 0     | 58,5    | 0      | 10,73294  | 11,5    | 37,7       | 0      | 13,08892     |
|       | 8 Desember  | 0     | 37,2    | 108    | 7,694889  | 8,5     | 14,7       | 0      | 68,30099     |
|       |             |       |         |        | 99,96286  |         |            |        | 1,764849     |
|       | 3 February  | 15    | 27      | 49,5   | 23,29981  | 55      | 11         | 0      | 35,98511     |
|       | 28 Nopember | 6     | 0       | 83,5   | 9,439912  | 0       | 92,5       | 0      | 75,03276 MAX |
|       |             |       |         |        |           |         |            |        |              |
| Tahun | Tempat, tgl | Sapon | seyegan | badran | gendongan | kenteng | kalibawang | godean |              |
| 2010  | 8 september | 48,6  | 0       | 0      | 19,86461  | 0       | 0          | 0      | 0,378812     |
|       |             |       |         |        |           |         |            |        |              |
|       | 6 Juni      | 0     | 0       | 115,3  | 1,269724  | 0       | 0          | 0      | 66,80334 MAX |
|       |             |       |         |        | 104,7337  |         |            |        | 1,849079     |
|       | 18 Oktober  | 0     | 0       | 0      | 16,30067  | 67      | 0          | 0      | 4,029279     |
|       |             |       |         |        |           |         |            |        |              |

| Tahun | Empat, tgl | Sapon | seyegan | badran   | enongan  | kenteng | kalibawang | godean | CH rerata    |
|-------|------------|-------|---------|----------|----------|---------|------------|--------|--------------|
| 2011  | 25-Feb     | 81    | 35      | 38,38617 | 50,52073 | 44      | 46         | 0      | 39,67878     |
|       | 04-Nov     | 40    | 75      | 40,98497 | 35,4036  | 10,5    | 39,4       | 36,3   | 39,41082     |
|       |            |       |         | 50,05488 |          |         |            |        | 28,99142     |
|       |            |       |         |          | 72,93284 |         |            |        | 1,287633     |
|       | 05-Mei     | 50,3  | 32      | 24,46942 | 37,43995 | 54      | 7,4        | 0      | 20,79495     |
|       | 06-Mar     | 22,9  | 1       | 28,61411 | 15,14771 | 0       | 82         | 0      | 40,37058 MAX |
|       | 11-Des     | 15    | 0       | 8,410507 | 12,9143  | 0       | 1,6        | 37     | 6,874068     |
| Tahun | Empat, tgl | Sapon | seyegan | badran   | enongan  | kenteng | kalibawang | godean |              |
| 2013  | 20-Des     | 95    | 45      | 72,86419 | 84       | 170     | 39         | 42     | 67,01163     |
|       | 25-Mei     | 4,3   | 95      | 45,63596 | 2,4      | 0       | 70         | 42,5   | 50,39861     |
|       |            |       |         | 84,18149 |          |         |            |        | 48,7573      |
|       | 19-Des     | 14,2  | 0       | 40,18014 | 150      | 26,7    | 22         | 76     | 36,40834     |
|       | 20-Des     | 95    | 45      | 72,86419 | 84       | 170     | 39         | 42     | 67,01163     |
|       | 06-Jan     | 93,2  | 72      | 77,76265 | 53       | 89      | 93         | 53,5   | 81,3262 MAX  |
|       | 14-Nov     | 20,1  | 35      | 29,96466 | 49       | 19      | 2          | 79     | 23,52968     |

Lampiran 4.1 Tabel Hasil Perhitungan Curah Hujan

| NO         | $\Sigma$    | $\Sigma \log X_i$ | $\Sigma \log X_i^2$ | $\Sigma \log X_i^3$ | P            |
|------------|-------------|-------------------|---------------------|---------------------|--------------|
|            |             |                   |                     |                     | %            |
| 1          | 35,25451984 | 1,547215          | -0,215199035        | 0,046310625         | -0,009966002 |
| 2          | 36,10788089 | 1,557602          | -0,204811838        | 0,041947889         | -0,008591424 |
| 3          | 40,37058457 | 1,606065          | -0,156348801        | 0,024444947         | -0,003821938 |
| 4          | 41,28927122 | 1,615837          | -0,146576621        | 0,021484706         | -0,003149156 |
| 5          | 45,0943283  | 1,654122          | -0,108291916        | 0,011727139         | -0,001269954 |
| 6          | 46,20544139 | 1,664693          | -0,097720715        | 0,009549338         | -0,000933168 |
| 7          | 46,3115113  | 1,665689          | -0,096724885        | 0,009355703         | -0,000904929 |
| 8          | 48,58786089 | 1,686528          | -0,075886059        | 0,005758694         | -0,000437005 |
| 9          | 49,8105725  | 1,697322          | -0,065092305        | 0,004237008         | -0,000275797 |
| 10         | 50,98709057 | 1,70746           | -0,054953608        | 0,003019899         | -0,000165954 |
| 11         | 51,93027014 | 1,715421          | -0,046993257        | 0,002208366         | -0,000103778 |
| 12         | 53,98942414 | 1,732309          | -0,030105144        | 0,00090632          | -2,72849E-05 |
| 13         | 56,37117827 | 1,751057          | -0,011356726        | 0,000128975         | -1,46474E-06 |
| 14         | 66,80333575 | 1,824798          | 0,06238431          | 0,003891802         | 0,000242787  |
| 15         | 73,05838182 | 1,86367           | 0,10125621          | 0,01025282          | 0,001038162  |
| 16         | 75,03275885 | 1,875251          | 0,112837076         | 0,012732206         | 0,001436665  |
| 17         | 76,71079677 | 1,884856          | 0,122442655         | 0,014992204         | 0,001835685  |
| 18         | 81,32620345 | 1,91023           | 0,14781666          | 0,021849765         | 0,003229759  |
| 19         | 135,6550384 | 2,132436          | 0,37002209          | 0,136916347         | 0,050662073  |
| 20         | 143,1250819 | 2,155716          | 0,393301909         | 0,154686392         | 0,060838453  |
| $\Sigma =$ | 1254,021531 | 35,24828          | -6,21725E-15        | 0,536401145         | 1000         |

n = 20  
 $\Sigma \log X_i$  rerata = 1,762413839  
 $SD = 0,168022734$   
 $Cs_{excel} = 1,105047391$

| P  | Persen Ch | G                    | Log X       | X           |
|----|-----------|----------------------|-------------|-------------|
| %  | %         | (Tabel Log Pearson3) |             |             |
| 10 | 90        | -1,105940048         | 1,576590768 | 37,72165754 |
| 20 | 80        | -0,847798104         | 1,619964483 | 41,6835293  |
| 30 | 70        | -0,625451106         | 1,657323834 | 45,42802267 |
| 40 | 60        | -0,403104107         | 1,694683184 | 49,50888943 |
| 50 | 50        | -0,180757109         | 1,732042535 | 53,95634652 |
| 60 | 40        | 0,127609874          | 1,783855199 | 60,79322723 |
| 70 | 30        | 0,435976857          | 1,835667862 | 68,49641824 |
| 80 | 20        | 0,744343839          | 1,887480526 | 77,17569086 |
| 90 | 10        | 1,340949526          | 1,987723845 | 97,21288785 |

Lampiran 4.2 Tabel Perhitungan Analisis Distribusi Frekuensi Log Pearson III