

LAMPIRAN

Portside

| No | Lajur | Frame | to (mm) | ta (mm) | Δt (mm) | Δt (%) |
|--------------|-------|----------|---------|---------|-----------------|----------------|
| 1 | A | 29 - 42 | 14.5 | 14.1 | 0.4 | 2.76 |
| 2 | A | 43 - 55 | 13.9 | 13.26 | 0.64 | 4.60 |
| 3 | A | 53 - 62 | 14.1 | 10.72 | 3.38 | 23.97 |
| 4 | A | 63 - 80 | 13.34 | 12.86 | 0.48 | 3.60 |
| 5 | A | 81 - 93 | 12.89 | 8.89 | 4 | 31.03 |
| 6 | A | 94 - 106 | 13.12 | 13.05 | 0.07 | 0.53 |
| 7 | B | 29 - 42 | 13.9 | 11.25 | 2.65 | 19.06 |
| 8 | B | 43 - 55 | 13.9 | 13.6 | 0.3 | 2.16 |
| 9 | B | 53 - 62 | 13.8 | 12.19 | 1.61 | 11.67 |
| 10 | B | 63 - 80 | 13.68 | 9.67 | 4.01 | 29.31 |
| 11 | B | 81 - 93 | 12.9 | 10.07 | 2.83 | 21.94 |
| 12 | B | 94 - 106 | 14.4 | 14.22 | 0.18 | 1.25 |
| 13 | C | 29 - 42 | 13.9 | 13.56 | 0.34 | 2.45 |
| 14 | C | 43 - 55 | 13.5 | 11.09 | 2.41 | 17.85 |
| 15 | C | 53 - 62 | 13.6 | 13.13 | 0.47 | 3.46 |
| 16 | C | 63 - 80 | 13.21 | 8.39 | 4.82 | 36.49 |
| 17 | C | 81 - 93 | 13.75 | 10.72 | 3.03 | 22.04 |
| 18 | C | 94 - 106 | 14.34 | 14.14 | 0.2 | 1.39 |
| Total | | | | | | 235.561 |
| Rata2 | | | | | | 13.087 |

$$\Delta t(\%) = (t_o - t_a / t_o) \times 100\% \dots\dots\dots (4.2)$$

$$\Delta t(\%) = (14.5 - 14.1 / 14.5) \times 100\%$$

$$\Delta t(\%) = (0.0276) \times 100 \%$$

$$\Delta t(\%) = 2.76 \%$$

| No | Lajur | Frame | P(m) | L(m) | To (m) | Ta (m) | Density | Wo (gr) | Wa (gr) |
|----|-------|----------|------|------|---------|---------|---------|-----------|-----------|
| 1 | A | 29 - 42 | 9 | 1.35 | 0.0145 | 0.0141 | 7.85 | 1,382,974 | 1,344,823 |
| 2 | A | 43 - 55 | 9 | 1.35 | 0.0139 | 0.01326 | 7.85 | 1,325,747 | 1,264,706 |
| 3 | A | 53 - 62 | 8.9 | 1.35 | 0.0141 | 0.01072 | 7.85 | 1,329,880 | 1,011,086 |
| 4 | A | 63 - 80 | 8.9 | 1.35 | 0.01334 | 0.01286 | 7.85 | 1,258,199 | 1,212,926 |
| 5 | A | 81 - 93 | 8.7 | 1.35 | 0.01289 | 0.00889 | 7.85 | 1,188,435 | 819,642 |
| 6 | A | 94 - 106 | 9.4 | 1.35 | 0.01312 | 0.01305 | 7.85 | 1,306,968 | 1,299,995 |
| 7 | B | 29 - 42 | 9 | 2.7 | 0.0139 | 0.01125 | 7.85 | 2,651,495 | 2,145,994 |
| 8 | B | 43 - 55 | 9 | 2.7 | 0.0139 | 0.0136 | 7.85 | 2,651,495 | 2,594,268 |
| 9 | B | 53 - 62 | 8.9 | 2.7 | 0.0138 | 0.01219 | 7.85 | 2,603,170 | 2,299,467 |
| 10 | B | 63 - 80 | 8.9 | 2.7 | 0.01368 | 0.00967 | 7.85 | 2,580,534 | 1,824,105 |
| 11 | B | 81 - 93 | 8.7 | 2.7 | 0.0129 | 0.01007 | 7.85 | 2,378,715 | 1,856,873 |
| 12 | B | 94 - 106 | 9.4 | 2.7 | 0.0144 | 0.01422 | 7.85 | 2,868,955 | 2,833,093 |
| 13 | C | 29 - 42 | 9 | 2.45 | 0.0139 | 0.01356 | 7.85 | 2,405,986 | 2,347,134 |
| 14 | C | 43 - 55 | 9 | 2.45 | 0.0135 | 0.01109 | 7.85 | 2,336,749 | 1,919,596 |
| 15 | C | 53 - 62 | 8.9 | 2.45 | 0.0136 | 0.01313 | 7.85 | 2,327,902 | 2,247,452 |
| 16 | C | 63 - 80 | 8.9 | 2.45 | 0.01321 | 0.00839 | 7.85 | 2,261,146 | 1,436,110 |
| 17 | C | 81 - 93 | 8.7 | 2.45 | 0.01375 | 0.01072 | 7.85 | 2,300,688 | 1,793,700 |
| 18 | C | 94 - 106 | 9.4 | 2.45 | 0.01434 | 0.01414 | 7.85 | 2,592,464 | 2,556,307 |

$$W_o = P \times L \times t_o \times D \quad \dots\dots\dots (4.3)$$

$$W_a = P \times L \times t_a \times D \quad \dots\dots\dots (4.4)$$

$$W_o = 9 \times 1.35 \times 0.0145 \times 7.85 = 1,382,974 \text{ gr}$$

$$W_a = 9 \times 1.35 \times 0.0141 \times 7.85 = 1,344,823 \text{ gr}$$

| No | Lajur | Frame | ΔW (gr) | Area (cm ²) | K | Density | T (th) | Laju korosi (cm/th) |
|--------------|-------|----------|---------|-------------------------|-------|---------|--------|---------------------|
| 1 | A | 29 - 42 | 38,151 | 121500 | 0.082 | 7.85 | 2.5 | 0.001 |
| 2 | A | 43 - 55 | 61,042 | 121500 | 0.082 | 7.85 | 2.5 | 0.002 |
| 3 | A | 53 - 62 | 318,794 | 120150 | 0.082 | 7.85 | 2.5 | 0.011 |
| 4 | A | 63 - 80 | 45,273 | 120150 | 0.082 | 7.85 | 2.5 | 0.002 |
| 5 | A | 81 - 93 | 368,793 | 117450 | 0.082 | 7.85 | 2.5 | 0.013 |
| 6 | A | 94 - 106 | 6,973 | 126900 | 0.082 | 7.85 | 2.5 | 0.000 |
| 7 | B | 29 - 42 | 505,501 | 243000 | 0.082 | 7.85 | 2.5 | 0.009 |
| 8 | B | 43 - 55 | 57,227 | 243000 | 0.082 | 7.85 | 2.5 | 0.001 |
| 9 | B | 53 - 62 | 303,703 | 240300 | 0.082 | 7.85 | 2.5 | 0.005 |
| 10 | B | 63 - 80 | 756,428 | 240300 | 0.082 | 7.85 | 2.5 | 0.013 |
| 11 | B | 81 - 93 | 521,842 | 234900 | 0.082 | 7.85 | 2.5 | 0.009 |
| 12 | B | 94 - 106 | 35,862 | 253800 | 0.082 | 7.85 | 2.5 | 0.001 |
| 13 | C | 29 - 42 | 58,851 | 220500 | 0.082 | 7.85 | 2.5 | 0.001 |
| 14 | C | 43 - 55 | 417,153 | 220500 | 0.082 | 7.85 | 2.5 | 0.008 |
| 15 | C | 53 - 62 | 80,450 | 218050 | 0.082 | 7.85 | 2.5 | 0.002 |
| 16 | C | 63 - 80 | 825,036 | 218050 | 0.082 | 7.85 | 2.5 | 0.016 |
| 17 | C | 81 - 93 | 506,988 | 213150 | 0.082 | 7.85 | 2.5 | 0.010 |
| 18 | C | 94 - 106 | 36,157 | 230300 | 0.082 | 7.85 | 2.5 | 0.001 |
| Total | | | | | | | | 0.104 |
| Rata2 | | | | | | | | 0.006 |

$$Cr = \frac{KxW}{Ax Dx T} \text{ (cm/tahun)}$$

$$Cr = \frac{0.082 \times 38,151}{121500 \times 7.85 \times 2.5}$$

$$Cr = 0.001 \text{ cm/tahun}$$

Starboard side

| No | Lajur | Frame | to (mm) | ta (mm) | Δt (mm) | Δt (%) |
|----|-------|----------|---------|---------|-----------------|----------------|
| 1 | A | 29 - 42 | 13.7 | 8.56 | 5.14 | 37.52 |
| 2 | A | 43 - 55 | 14.3 | 10.63 | 3.67 | 25.66 |
| 3 | A | 53 - 62 | 13.9 | 10.63 | 3.27 | 23.53 |
| 4 | A | 63 - 80 | 14 | 11.77 | 2.23 | 15.93 |
| 5 | A | 81 - 93 | 13.35 | 11.17 | 2.18 | 16.33 |
| 6 | A | 94 - 106 | 13.9 | 13.12 | 0.78 | 5.61 |
| 7 | B | 29 - 42 | 14.1 | 8.56 | 5.54 | 39.29 |
| 8 | B | 43 - 55 | 14 | 12.76 | 1.24 | 8.86 |
| 9 | B | 53 - 62 | 13.29 | 7.36 | 5.93 | 44.62 |
| 10 | B | 63 - 80 | 13 | 12.6 | 0.4 | 3.08 |
| 11 | B | 81 - 93 | 13.9 | 11.13 | 2.77 | 19.93 |
| 12 | B | 94 - 106 | 12.8 | 12.19 | 0.61 | 4.77 |
| 13 | C | 29 - 42 | 14 | 13.49 | 0.51 | 3.64 |
| 14 | C | 43 - 55 | 13.9 | 13.12 | 0.78 | 5.61 |
| 15 | C | 53 - 62 | 13 | 12.81 | 0.19 | 1.46 |
| 16 | C | 63 - 80 | 13.2 | 12.1 | 1.1 | 8.33 |
| 17 | C | 81 - 93 | 14.3 | 10.89 | 3.41 | 23.85 |
| 18 | C | 94 - 106 | 13.54 | 13.22 | 0.32 | 2.36 |
| | | | | | Total | 290.375 |
| | | | | | Rata2 | 16.132 |

$$\Delta t(\%) = (t_o - t_a / t_o) \times 100\% \dots\dots\dots (4.2)$$

$$\Delta t(\%) = (13.7 - 8.56 / 13.7) \times 100\%$$

$$\Delta t(\%) = (0.3752) \times 100 \%$$

$$\Delta t(\%) = 37.52 \%$$

| No | Lajur | Frame | P (m) | L (m) | To (m) | Ta (m) | Density | Wo (gr) | Wa (gr) |
|----|-------|----------|-------|-------|---------|---------|---------|-----------|-----------|
| 1 | A | 29 - 42 | 9 | 1.35 | 0.0137 | 0.00856 | 7.85 | 1,306,672 | 816,431 |
| 2 | A | 43 - 55 | 9 | 1.35 | 0.0143 | 0.01063 | 7.85 | 1,363,898 | 1,013,863 |
| 3 | A | 53 - 62 | 8.9 | 1.35 | 0.0139 | 0.01063 | 7.85 | 1,311,017 | 1,002,598 |
| 4 | A | 63 - 80 | 8.9 | 1.35 | 0.014 | 0.01177 | 7.85 | 1,320,449 | 1,110,120 |
| 5 | A | 81 - 93 | 8.7 | 1.35 | 0.01335 | 0.01117 | 7.85 | 1,230,847 | 1,029,854 |
| 6 | A | 94 - 106 | 9.4 | 1.35 | 0.0139 | 0.01312 | 7.85 | 1,384,669 | 1,306,968 |
| 7 | B | 29 - 42 | 9 | 2.7 | 0.0141 | 0.00856 | 7.85 | 2,689,646 | 1,632,863 |
| 8 | B | 43 - 55 | 9 | 2.7 | 0.014 | 0.01276 | 7.85 | 2,670,570 | 2,434,034 |
| 9 | B | 53 - 62 | 8.9 | 2.7 | 0.01329 | 0.00736 | 7.85 | 2,506,966 | 1,388,357 |
| 10 | B | 63 - 80 | 8.9 | 2.7 | 0.013 | 0.0126 | 7.85 | 2,452,262 | 2,376,807 |
| 11 | B | 81 - 93 | 8.7 | 2.7 | 0.0139 | 0.01113 | 7.85 | 2,563,111 | 2,052,333 |
| 12 | B | 94 - 106 | 9.4 | 2.7 | 0.0128 | 0.01219 | 7.85 | 2,550,182 | 2,428,650 |
| 13 | C | 29 - 42 | 9 | 2.45 | 0.014 | 0.01349 | 7.85 | 2,423,295 | 2,335,018 |
| 14 | C | 43 - 55 | 9 | 2.45 | 0.0139 | 0.01312 | 7.85 | 2,405,986 | 2,270,974 |
| 15 | C | 53 - 62 | 8.9 | 2.45 | 0.013 | 0.01281 | 7.85 | 2,225,200 | 2,192,678 |
| 16 | C | 63 - 80 | 8.9 | 2.45 | 0.0132 | 0.0121 | 7.85 | 2,259,434 | 2,071,148 |
| 17 | C | 81 - 93 | 8.7 | 2.45 | 0.0143 | 0.01089 | 7.85 | 2,392,715 | 1,822,145 |
| 18 | C | 94 - 106 | 9.4 | 2.45 | 0.01354 | 0.01322 | 7.85 | 2,447,836 | 2,389,984 |

$$W_o = P \times L \times t_o \times D \quad \dots\dots\dots (4.3)$$

$$W_a = P \times L \times t_a \times D \quad \dots\dots\dots (4.4)$$

$$W_o = 9 \times 1.35 \times 0.0137 \times 7.85 = 1,306,672 \text{ gr}$$

$$W_a = 9 \times 1.35 \times 0.00856 \times 7.85 = 816,431 \text{ gr}$$

| No | Lajur | Frame | ΔW (gr) | Area (cm ²) | K | Density | T (th) | Laju korosi (cm/th) |
|--------------|-------|----------|-----------|-------------------------|-------|---------|--------|---------------------|
| 1 | A | 29 - 42 | 490,240 | 121500 | 0.082 | 7.85 | 2.5 | 0.017 |
| 2 | A | 43 - 55 | 350,035 | 121500 | 0.082 | 7.85 | 2.5 | 0.012 |
| 3 | A | 53 - 62 | 308,419 | 120150 | 0.082 | 7.85 | 2.5 | 0.011 |
| 4 | A | 63 - 80 | 210,329 | 120150 | 0.082 | 7.85 | 2.5 | 0.007 |
| 5 | A | 81 - 93 | 200,992 | 117450 | 0.082 | 7.85 | 2.5 | 0.007 |
| 6 | A | 94 - 106 | 77,701 | 126900 | 0.082 | 7.85 | 2.5 | 0.003 |
| 7 | B | 29 - 42 | 1,056,783 | 243000 | 0.082 | 7.85 | 2.5 | 0.018 |
| 8 | B | 43 - 55 | 236,536 | 243000 | 0.082 | 7.85 | 2.5 | 0.004 |
| 9 | B | 53 - 62 | 1,118,609 | 240300 | 0.082 | 7.85 | 2.5 | 0.019 |
| 10 | B | 63 - 80 | 75,454 | 240300 | 0.082 | 7.85 | 2.5 | 0.001 |
| 11 | B | 81 - 93 | 510,778 | 234900 | 0.082 | 7.85 | 2.5 | 0.009 |
| 12 | B | 94 - 106 | 121,532 | 253800 | 0.082 | 7.85 | 2.5 | 0.002 |
| 13 | C | 29 - 42 | 88,277 | 220500 | 0.082 | 7.85 | 2.5 | 0.002 |
| 14 | C | 43 - 55 | 135,012 | 220500 | 0.082 | 7.85 | 2.5 | 0.003 |
| 15 | C | 53 - 62 | 32,522 | 218050 | 0.082 | 7.85 | 2.5 | 0.001 |
| 16 | C | 63 - 80 | 188,286 | 218050 | 0.082 | 7.85 | 2.5 | 0.004 |
| 17 | C | 81 - 93 | 570,571 | 213150 | 0.082 | 7.85 | 2.5 | 0.011 |
| 18 | C | 94 - 106 | 57,851 | 230300 | 0.082 | 7.85 | 2.5 | 0.001 |
| Total | | | | | | | | 0.131 |
| Rata2 | | | | | | | | 0.007 |

$$Cr = \frac{KxW}{Ax Dx T} \text{ (cm/tahun)}$$

$$Cr = \frac{0.082 \times 490,240}{121500 \times 7.85 \times 2.5}$$

$$Cr = 0.017 \text{ cm/tahun}$$