

BAB 4

HASIL PENELITIAN DAN PEMBAHASAN

4.1 Data Penelitian

Data umum proyek pembangunan gedung X.

Pemilik Proyek	: X
Konsultan Supervisi	: PT. Y
Kontraktor	: PT. Z
Anggaran	: Rp.17.792.485.780,55
Anggaran <i>Baseline</i>	: Rp.17.322.738.669,00
Waktu Pelaksanaan	: 154 hari

4.2 Daftar Kegiatan- Kegiatan Kritis

Berikut kegiatan- kegiatan kritis yang didapat dari analisis dengan menggunakan *microsoft project 2010*.

Tabel 4.1 Daftar kegiatan kritis kondisi normal

Kode	Kegiatan	Durasi
BKB	Bekisting Balok Basement	7
PBB	Pembesian Balok Basement	7
BTB	Beton Balok Basement	5
PP	Pembesian Plat A3	7
BP	Beton Plat A3	7
BKDPL	Bekisting Dinding Pit Lift	7
PDPL	Pembesian Dinding Pit Lift	7
BDPL	Beton Dinding Pit Lift	5
BKPB	Bekisting Plat Basement	14
BKK1	Bekisting Kolom Lt.1	7
PK1	Pembesian Kolom Lt.1	7
BTK1	Beton Kolom Lt.1	5
BKB1	Bekisting Balok Lt.1	14
BKK2	Bekisting Kolom Lt.2	7
PK2	Pembesian Kolom Lt.2	7
BTK2	Beton Kolom Lt.2	5
BKB2	Bekisting Balok Lt.2	14

Lanjutan Tabel 4.1Daftar kegiatan kritis kondisi normal

Kode	Kegitatan	Durasi
PK3	Pembesian Kolom Lt.3	7
BTK3	Beton Kolom Lt3	5
BKB3	Bekisting Balok Lt.3	14
BKK4	Bekisting Kolom Lt.4	7
PK4	Pembesian Kolom Lt.4	7
BTK4	Beton Kolom Lt.4	5
BKB4	Bekisting Balok Lt.4	14
BKK5	Bekisting Kolom Lt.5	7
PK5	Pembesian Kolom Lt.5	7
BTK5	Beton Kolom Lt.5	5
BKB5	Bekisting Balok Lt.5	14
BKK6	Bekisting Kolom Lt.6	7
PK6	Pembesian Kolom Lt.6	7
BTK6	Beton Kolom Lt.6	5
BKB6	Bekisting Balok Lt.6	14
PB6	Pembesian Balok Lt.6	14
BTB6	Beton Balok Lt.6	7
BKT6	Bekisting Tangga Lt.6	7
PT6	Pembesian Tangga Lt.6	7
BTT6	Beton Tangga Lt.6	5

Adapun terpilihnya item pekerjaan tersebut untuk dilakukan percepatan sebagai kegiatan kritis adalah:

1. Kegiatan kritis tersebut memiliki *resource work* atau pekerja sehingga dapat dilakukan percepatan dengan cara penambahan jam kerja (lembur) dan tenaga kerja. Pada penambahan tenaga kerja hanya bisa dilakukan untuk kegiatan - kegiatan kritis sehingga kegiatan yang lainnya tidak terjadi perubahan dari segi waktu ataupun tenaga kerja.
2. Dari kegiatan - kegiatan kritis tersebut jika dilakukan percepatan maka sangat berpengaruh terhadap biaya tidak langsung suatu proyek.

4.3 Penerapan Metode Time Cost Trade Off

4.3.1 Penambahan Jam Kerja (Waktu Lembur)

Pada proyek ini jam kerja normal yaitu 7 jam (08.00 – 16.00) dengan waktu istirahat yaitu 1 jam (12.00 – 13.00). Kemudian jam kerja lembur dilakukan setelah waktu kerja normal selama 3 jam (18.00 – 21.00) dengan pertimbangan peraturan yang telah ada. Menurut keputusan Menteri Tenaga Kerja Nomor KEP.102/MEN/VI/2004 pasal 3, pasal 7, dan pasal 11 standar upah untuk lembur adalah sebagai berikut ini.

1. Waktu kerja lembur hanya dapat dilakukan paling banyak 3 (jam) dalam 1 (satu) hari dan 14 (empat belas) jam dalam 1 (satu) minggu,
2. Memberikan makanan dan minuman sekurang-kurangnya 1.400 kalori apabila kerja lembur dilakukan selama 3 jam atau lebih,
3. Untuk kerja lembur pertama harus dibayar sebesar 1,5 (satu setengah) kali upah sejam, dan
4. Untuk setiap jam kerja lembur berikutnya harus dibayar upah sebesar 2 (dua) kali lipat upah satu jam.

Tabel 4.2 Upah tenaga kerja

Jenis Pekerja	Biaya Normal/Hari (Rp)	Biaya Normal/Jam (Rp)
Pekerja	50,000	7,143
Kepala Tukang	90,000	12,857
Mandor	90,000	12,857
Tukang Batu	85,000	12,143
Tukang Besi	90,000	12,857
Tukang Kayu	85,000	12,143

4.3.2 Analisis Biaya Lembur

Biaya lembur dihitung untuk mengetahui besar upah biaya lembur tenaga kerja sehingga biaya total kegiatan yang akan dilembur

dapat diketahui juga. Contoh perhitungan upah lembur adalah sebagai berikut ini.

$$\begin{aligned}
 \text{Resource name} &= \text{Mandor} \\
 \text{Biaya normal perhari} &= \text{Rp. } 90.000,00 \\
 \text{Jam kerja normal perhari} &= 7 \text{ jam/hari} \\
 \text{Biaya normal per jam} &= \frac{\text{Rp. } 90.000,00}{7 \text{ jam/hari}} \\
 &= \text{Rp. } 12.857,14
 \end{aligned}$$

Biaya lembur per jam

$$\begin{aligned}
 \text{Lembur 1 jam} &= 1,5 \times \text{biaya normal / jam} \\
 &= 1,5 \times \text{Rp. } 12.857,14 \\
 &= \text{Rp. } 19.285,71
 \end{aligned}$$

$$\begin{aligned}
 \text{Lembur per/jam untuk 1 jam} &= \frac{\text{Rp. } 19.285,71}{1 \text{ jam}} \\
 &= \text{Rp. } 19.285,71
 \end{aligned}$$

$$\begin{aligned}
 \text{Lembur 2 jam} &= (1,5 \times \text{biaya normal/jam}) + (2 \times (1 \times \text{biaya normal/jam})) \\
 &= (1,5 \times \text{Rp. } 12.857,14) + (2 \times (1 \times \text{Rp. } 12.857,14)) \\
 &= \text{Rp. } 45.000,00
 \end{aligned}$$

$$\begin{aligned}
 \text{Lembur per/jam untuk 2 jam} &= \frac{\text{Rp. } 45.000,00}{2 \text{ jam}} \\
 &= \text{Rp. } 22.500,00
 \end{aligned}$$

$$\begin{aligned}
 \text{Lembur 3 jam} &= (1,5 \times \text{biaya normal/jam}) + (2 \times (2 \times \text{biaya normal/jam})) \\
 &= (1,5 \times \text{Rp. } 12.857,14) + (2 \times (2 \times \text{Rp. } 12.857,14)) \\
 &= \text{Rp. } 70.714,29
 \end{aligned}$$

$$\begin{aligned}
 \text{Lembur per/jam untuk 3 jam} &= \frac{\text{Rp. } 70.714,29}{3 \text{ jam}} \\
 &= \text{Rp. } 23.571,43
 \end{aligned}$$

Tabel 4.3 Upah lembur tenaga kerja

Pekerja	Biaya Normal/Jam (Rp)	Biaya Lembur (Rp)		
		1 Jam	2 Jam	3 Jam
Pekerja	7,142.86	10,714.29	25,000.00	39,285.71
Kepala Tukang	12,857.14	19,285.71	45,000.00	70,714.29
Mandor	12,857.14	19,285.71	45,000.00	70,714.29
Tukang Batu	12,142.86	18,214.29	42,500.00	66,785.71
Tukang Besi	12,857.14	19,285.71	45,000.00	70,714.29
Tukang Kayu	12,142.86	18,214.29	42,500.00	66,785.71

4.3.3 Analisis Durasi Percepatan

Setelah mengetahui biaya lembur, kemudian masuk pada tahap *crashing*. Tahap *crashing* adalah tahap percepatan durasi untuk kegiatan-kegiatan kritis. Dalam perhitungan ini terdapat produktivitas kerja untuk masing-masing waktu lembur. Produktivitas kerja lembur 1 jam per hari yaitu sebesar 0,9 atau 90%, 2 jam per hari yaitu sebesar 0,8 atau 80%, dan 3 jam perhari yaitu menjadi sebesar 0,7 atau 70%. Penurunan produktivitas disebabkan berbagai faktor, misalnya kondisi penerangan yang terbatas karena malam hari dan kelelahan para pekerja. Perhitungan percepatan durasi ini diambil contoh dari kegiatan kritis pekerjaan pembesian balok basement (PKB) dengan contoh perhitungan sebagai berikut.

- Durasi yang bisa dipercepat berdasarkan 1 jam lembur.

Volume

$$(\sum pp \times pn \times \text{jam lembur}) + (pn \times \text{jam kerja normal})$$

Keterangan :

pp : penurunan produktivitas

kerja pn : produktivitas normal

Data :

Volume = 25653,30 kg

Durasi normal = 7 hari

Jam kerja normal = 7 jam kerja

$$\text{Produktivitas per hari} = \frac{\text{Volume (m}^2\text{)}}{\text{Durasi (hari)}} = \frac{25653,30 \text{ kg}}{7 \text{ hari}}$$

$$= 3664,76 \text{ kg/hari}$$

$$\text{Produktivitas per jam} = \frac{\text{Produktivitas per hari}}{\text{Jam kerja/hari}} = \frac{3664,76 \text{ kg/hari}}{7 \text{ jam}}$$

$$= 523,54 \text{ kg/hari}$$

$$\text{Maksimal percepatan} = \frac{25653,30}{(0,09 \times 523,54 \times 1) + (523,54 \times 7)}$$

$$= 6,20 \text{ hari}$$

Maka, maksimal percepatan = Durasi normal – durasi percepatan

$$= 7 \text{ hari} - 6,20 \text{ hari}$$

$$= 0,80 \text{ hari}$$

- Durasi yang bisa dipercepat berdasarkan 2 jam lembur.

Volume

$$(\sum pp \times pn \times \text{jam lembur}) + (pn \times \text{jam kerja normal})$$

Keterangan :

pp : penurunan produktivitas

kerja pn : produktivitas normal

Data :

Volume = 25653,30 kg

Durasi normal = 7 hari

Jam kerja normal = 7 jam kerja

$$\text{Produktivitas per hari} = \frac{\text{Volume (m}^2\text{)}}{\text{Durasi (hari)}} = \frac{25653,30 \text{ kg}}{7 \text{ hari}}$$

$$= 3664,76 \text{ kg/hari}$$

$$\text{Produktivitas per jam} = \frac{\text{Produktivitas per hari}}{\text{Jam kerja/hari}} = \frac{3664,76 \text{ kg/hari}}{7 \text{ jam}}$$

$$= 523,54 \text{ kg/hari}$$

$$\begin{aligned} \text{Maksimal percepatan} &= \frac{25653,30}{(0,8 \times 523,54 \times 1) + (0,9 \times 523,54 \times 1) + (523,54 \times 7)} \\ &= 5,63 \text{ hari} \end{aligned}$$

$$\begin{aligned} \text{Maka, maksimal percepatan} &= \text{Durasi normal} - \text{durasi percepatan} \\ &= 7 \text{ hari} - 5,63 \text{ hari} \\ &= 1,37 \text{ hari} \end{aligned}$$

- Durasi yang bisa dipercepat berdasarkan 3 jam lembur.

$$\frac{\text{Volume}}{(\sum pp \times pn \times \text{jam lembur}) + (pn \times \text{jam kerja normal})}$$

Keterangan :

pp : penurunan produktivitas

kerja pn : produktivitas normal

Data :

Volume = 25653,30 kg

Durasi normal = 7 hari

Jam kerja normal = 7 jam kerja

$$\begin{aligned} \text{Produktivas per hari} &= \frac{\text{Volume (m}^3\text{)}}{\text{Durasi (hari)}} = \frac{25653,30 \text{ kg}}{7 \text{ hari}} \\ &= 3664,76 \text{ kg/hari} \end{aligned}$$

$$\begin{aligned} \text{Produktivas per jam} &= \frac{\text{Produktivas per hari}}{\text{Jam kerja/hari}} = \frac{3664,76 \text{ kg/hari}}{7 \text{ jam}} \\ &= 523,54 \text{ kg/hari} \end{aligned}$$

Maksimal percepatan

$$= \frac{25653,30}{(0,7 \times 523,54 \times 1) + (0,8 \times 523,54 \times 1) + (0,9 \times 523,54 \times 1) + (523,54 \times 7)} = 5,21 \text{ hari}$$

$$\begin{aligned} \text{Maka, maksimal percepatan} &= \text{Durasi normal} - \text{durasi percepatan} \\ &= 7 \text{ hari} - 5,21 \text{ hari} \\ &= 1,78 \text{ hari} \end{aligned}$$

Tabel 4.4 Hasil perhitungan percepatan durasi lembur 1 jam

Kode	Nama Pekerjaan	Durasi (Hari)	
		Normal	Lembur
BKB	Bekisting Balok Basement	7	6.20
PBB	Pembesian Balok Basement	7	6.20
BTB	Beton Balok Basement	5	4.43
PP	Pembesian Plat A3	7	6.20
BP	Beton Plat A3	7	6.20
BKDPL	Bekisting Dinding Pit Lift	7	6.20
PDPL	Pembesian Dinding Pit Lift	7	6.20
BDPL	Beton Dinding Pit Lift	5	4.43
BKPB	Bekisting Plat Basement	14	12.41
BKK1	Bekisting Kolom Lt.1	7	6.20
PK1	Pembesian Kolom Lt.1	7	6.20
BTK1	Beton Kolom Lt.1	5	4.43
BKB1	Bekisting Balok Lt.1	14	12.41
BKK2	Bekisting Kolom Lt.2	7	6.20
PK2	Pembesian Kolom Lt.2	7	6.20
BTK2	Beton Kolom Lt.2	5	4.43
BKB2	Bekisting Balok Lt.2	14	12.41
BKK3	Bekisting Kolom Lt.3	7	6.20
PK3	Pembesian Kolom Lt.3	7	6.20
BTK3	Beton Kolom Lt.3	5	4.43
BKB3	Bekisting Balok Lt.3	14	12.41
BKK4	Bekisting Kolom Lt.4	7	6.20
PK4	Pembesian Kolom Lt.4	7	6.20
BTK4	Beton Kolom Lt.4	5	4.43
BKB4	Bekisting Balok Lt.4	14	12.41
BKK5	Bekisting Kolom Lt.5	7	6.20
PK5	Pembesian Kolom Lt.5	7	6.20
BTK5	Beton Kolom Lt.5	5	4.43
BKB5	Bekisting Balok Lt.5	14	12.41
BKK6	Bekisting Kolom Lt.6	7	6.20
PK6	Pembesian Kolom Lt.6	7	6.20
BTK6	Beton Kolom Lt.6	5	4.43
BKB6	Bekisting Balok Lt.6	14	12.41
PB6	Pembesian Balok Lt.6	14	12.41
BTB6	Beton Balok Lt.6	7	6.20
BKT6	Bekisting Tangga Lt.6	7	6.20
PT6	Pembesian Tangga Lt.6	7	6.20
BTT6	Beton Tangga Lt.6	5	4.43

Tabel 4.5 Hasil perhitungan percepatan durasi lembur 2 jam

Kode	Nama Pekerjaan	Durasi (Hari)	
		Normal	Lembur
BKB	Bekisting Balok Basement	7	5.63
PBB	Pembesian Balok Basement	7	5.63
BTB	Beton Balok Basement	5	4.02
PP	Pembesian Plat A3	7	5.63
BP	Beton Plat A3	7	5.63
BKDPL	Bekisting Dinding Pit Lift	7	5.63
PDPL	Pembesian Dinding Pit Lift	7	5.63
BDPL	Beton Dinding Pit Lift	5	4.02
BKPB	Bekisting Plat Basement	14	11.26
BKK1	Bekisting Kolom Lt.1	7	5.63
PK1	Pembesian Kolom Lt.1	7	5.63
BTK1	Beton Kolom Lt.1	5	4.02
BKB1	Bekisting Balok Lt.1	14	11.26
BKK2	Bekisting Kolom Lt.2	7	5.63
PK2	Pembesian Kolom Lt.2	7	5.63
BTK2	Beton Kolom Lt.2	5	4.02
BKB2	Bekisting Balok Lt.2	14	11.26
BKK3	Bekisting Kolom Lt.3	7	5.63
PK3	Pembesian Kolom Lt.3	7	5.63
BTK3	Beton Kolom Lt.3	5	4.02
BKB3	Bekisting Balok Lt.3	14	11.26
BKK4	Bekisting Kolom Lt.4	7	5.63
PK4	Pembesian Kolom Lt.4	7	5.63
BTK4	Beton Kolom Lt.4	5	4.02
BKB4	Bekisting Balok Lt.4	14	11.26
BKK5	Bekisting Kolom Lt.5	7	5.63
PK5	Pembesian Kolom Lt.5	7	5.63
BTK5	Beton Kolom Lt.5	5	4.02
BKB5	Bekisting Balok Lt.5	14	11.26
BKK6	Bekisting Kolom Lt.6	7	5.63
PK6	Pembesian Kolom Lt.6	7	5.63
BTK6	Beton Kolom Lt.6	5	4.02
BKB6	Bekisting Balok Lt.6	14	11.26
PB6	Pembesian Balok Lt.6	14	11.26
BTB6	Beton Balok Lt.6	7	5.63
BKT6	Bekisting Tangga Lt.6	7	5.63
PT6	Pembesian Tangga Lt.6	7	5.63
BTT6	Beton Tangga Lt.6	5	4.02

Tabel 4.6 Hasil perhitungan percepatan durasi lembur 3 jam

Kode	Nama Pekerjaan	Durasi (Hari)	
		Normal	Lembur
BKB	Bekisting Balok Basement	7	5.21
PBB	Pembesian Balok Basement	7	5.21
BTB	Beton Balok Basement	5	3.72
PP	Pembesian Plat A3	7	5.21
BP	Beton Plat A3	7	5.21
BKDPL	Bekisting Dinding Pit Lift	7	5.21
PDPL	Pembesian Dinding Pit Lift	7	5.21
BDTDL	Beton Dinding Pit Lift	5	3.72
BKPB	Bekisting Plat Basement	14	10.43
BKK1	Bekisting Kolom Lt.1	7	5.21
PK1	Pembesian Kolom Lt.1	7	5.21
BTK1	Beton Kolom Lt.1	5	3.72
BKB1	Bekisting Balok Lt.1	14	10.43
BKK2	Bekisting Kolom Lt.2	7	5.21
PK2	Pembesian Kolom Lt.2	7	5.21
BTK2	Beton Kolom Lt.2	5	3.72
BKB2	Bekisting Balok Lt.2	14	10.43
BKK3	Bekisting Kolom Lt.3	7	5.21
PK3	Pembesian Kolom Lt.3	7	5.21
BTK3	Beton Kolom Lt.3	5	3.72
BKB3	Bekisting Balok Lt.3	14	10.43
BKK4	Bekisting Kolom Lt.4	7	5.21
PK4	Pembesian Kolom Lt.4	7	5.21
BTK4	Beton Kolom Lt.4	5	3.72
BKB4	Bekisting Balok Lt.4	14	10.43
BKK5	Bekisting Kolom Lt.5	7	5.21
PK5	Pembesian Kolom Lt.5	7	5.21
BTK5	Beton Kolom Lt.5	5	3.72
BKB5	Bekisting Balok Lt.5	14	10.43
BKK6	Bekisting Kolom Lt.6	7	5.21
PK6	Pembesian Kolom Lt.6	7	5.21
BTK6	Beton Kolom Lt.6	5	3.72
BKB6	Bekisting Balok Lt.6	14	10.43
PB6	Pembesian Balok Lt.6	14	10.43
BTB6	Beton Balok Lt.6	7	5.21
BKT6	Bekisting Tangga Lt.6	7	5.21
PT6	Pembesian Tangga Lt.6	7	5.21
BTT6	Beton Tangga Lt.6	5	3.72

4.3.4 Analisis Biaya Percepatan

Hasil percepatan durasi akibat waktu lembur jam merupakan suatu perolehan dalam menentukan biaya percepatan. Kegiatan kritis yang dihitung dengan biaya percepatan durasi akibat adanya tambahan jam lembur menggunakan *Microsoft Project 2010* dengan dikontrol dari perhitungan *Microsoft Excel 2010*. Perhitungan percepatan durasi ini berpengaruh pada biaya lintasan kritis. Berikut merupakan contoh perhitungan biaya normal dan setelah penambahan jam lembur mulai dari 1 jam sampai dengan 3 jam pada pekerjaan pembesian balok basement (PBB).

1. Perhitungan waktu normal

Volume pekerjaan = 25653,30 kg

Durasi normal = 7 hari

Analisis biaya material pekerjaan pembesian pada balok basement sebagai berikut :

Tabel 4.7 Kebutuhan material pekerjaan pembesian balok *basement*

Komponen	Satuan	Koefisien	Harga (Rp)
Besi beton (polos/ulir)	kg	1.0100	Rp9.500
Kawat beton	kg	0.0150	Rp18.000

Biaya total resource = volume x koefisien x harga satuan

Besi beton ulir = 25653,30 kg x 1.0100 x Rp9.500
= Rp 246.143.439,18

Kawat beton = 25653,30 kg x 0.0150 x Rp18.000
= Rp6.926.391,72

Total biaya material = Rp 246.143.439,18 + Rp 6.926.391,72
= Rp253.069.830,90

Tabel 4.8 Kebutuhan tenaga kerja pekerjaan pembesian balok basement

Komponen	Satuan	Koefisien	Harga (Rp)
Pekerja	oh	3,66	Rp.7.143
Tukang Besi	oh	3,66	Rp.12.857
Kepala Tukang	oh	0,37	Rp.12.857
Mandor	oh	0,21	Rp.12.857

Analisis mengetahui perhitungan tenaga kerja pada pekerjaan pembesian balok basement sebagai berikut :

Harga tenaga kerja = jam kerja x koefisien x harga

$$\text{Pekerja} = 7 \times 3,66 \times \text{Rp}7.143 = \text{Rp}.183.237,88$$

$$\text{Tukang besi} = 7 \times 3,66 \times \text{Rp}.12.857 = \text{Rp}.329.828,18$$

$$\text{Kepala tukang} = 7 \times 0,37 \times \text{Rp}.12.857 = \text{Rp}.32.982,82$$

$$\text{Mandor} = 7 \times 0,21 \times \text{Rp}.12.857 = \text{Rp}.18.847,32$$

$$\begin{aligned} \text{Total harga tenaga kerja} &= \text{Rp}.183.237,88 + \text{Rp}.329.828,18 + \\ &\quad \text{Rp}.32.982,82 + \text{Rp}.18.847,32 \\ &= \text{Rp}.564.896,20 \end{aligned}$$

Total biaya = Total harga material + (Total harga tenaga kerja x durasi)

$$= \text{Rp}.253.069.830,90 + (\text{Rp}.564.896,20 \times 7)$$

$$= \text{Rp}.257.024.104,27$$

2. Perhitungan lembur 1 jam

Volume pekerjaan = 25653,30 kg

Durasi percepatan = 6,20 hari

Tabel 4.9 Kebutuhan tenaga kerja pekerjaan pembesian balok
basement

Tenaga kerja	Satuan	Harga lembur 1 jam	Harga lembur per jam
Pekerja	Oh	Rp 10,714.29	Rp 10,714.29
Tukang besi	Oh	Rp 19,285.71	Rp 19,285.71
Kepala tukang	Oh	Rp 19,285.71	Rp 19,285.71
Mandor	Oh	Rp 19,285.71	Rp 19,285.71

Harga tenaga kerja lembur 1 jam = koefisien x harga lembur

$$\text{Pekerja} = 3,66 \times \text{Rp.}10.714,29 = \text{Rp.}39.265,26$$

$$\text{Tukang besi} = 3,66 \times \text{Rp.}19.285,71 = \text{Rp.}70.677,47$$

$$\text{Kepala tukang} = 0,37 \times \text{Rp.}19.285,71 = \text{Rp.}7.067,75$$

$$\text{Mandor} = 0,21 \times \text{Rp.}19.285,71 = \text{Rp.}4.038,71$$

$$\begin{aligned} \text{Maka, total harga tenaga kerja} &= \text{Rp.}39.265,26 + \text{Rp.}70.677,47 + \\ &\quad \text{Rp.}7.067,75 + \text{Rp.}4.038,71 \\ &= \text{Rp.}121.049,18 \end{aligned}$$

Total biaya tenaga kerja percepatan 1 jam/hari

$$= \text{Biaya normal total /hari} + \text{total harga tenaga kerja 1 jam}$$

$$= \text{Rp.}564.896,20 + \text{Rp.}121.049,18$$

$$= \text{Rp.}685.945,38$$

Biaya total percepatan 1 Jam

$$= \text{Total harga material} + (\text{Total biaya tenaga kerja percepatan 1 jam} \times \text{durasi})$$

$$= \text{Rp.}253.069.830,90 + (\text{Rp.}685.945,38 \times 6,20)$$

$$= \text{Rp.}257.322.692,26$$

3. Perhitungan lembur 2 jam

Volume pekerjaan = 25653,30 kg

Durasi percepatan = 5,63 hari

Tabel 4.10 Kebutuhan tenaga kerja pekerjaan pembesian balok basement

Tenaga kerja	Satuan	Harga lembur 2 jam	Harga lembur per jam
Pekerja	Oh	Rp 25,000.00	Rp 12,500.00
Tukang besi	Oh	Rp 45,000.00	Rp 22,500.00
Kepala tukang	Oh	Rp 45,000.00	Rp 22,500.00
Mandor	Oh	Rp 45,000.00	Rp 22,500.00

Harga tenaga kerja lembur 2 jam = koefisien x harga lembur

Pekerja = 3,66 x Rp. 25.000,00 = Rp.91.618,94

Tukang besi = 3,66 x Rp. 45.000,00 = Rp.164.914,09

Kepala tukang = 0,37 x Rp. 45.000,00 = Rp.16.491,41

Mandor = 0,21 x Rp. 45.000,00 = Rp.9.423,66

Maka, total harga tenaga kerja = Rp.91.618,94 + Rp.164.914,09 +
Rp.16.491,41 + Rp.9.423,66
= Rp.282.448,10

Total biaya tenaga kerja percepatan 2 jam/hari

= Biaya normal total /hari + total harga tenaga kerja 2 jam

= Rp.564.896,20 + Rp.282.448,10

= Rp.847.344,29

Biaya total percepatan 2 Jam

= Total harga material + (Total biaya tenaga kerja percepatan 2 jam x durasi)

= Rp.253.069.830,90 + (Rp.847.344,29 x 5,63)

= Rp257.842.230,80

4. Perhitungan lembur 3 jam

Volume pekerjaan = 25653,30 kg

Durasi percepatan = 5,21 hari

Tabel 4.11 Kebutuhan tenaga kerja pekerjaan pembesian balok basement

Tenaga kerja	Satuan	Harga lembur 3 jam	Harga lembur per jam
Pekerja	Oh	Rp 39,285.71	Rp 13,095.24
Tukang besi	Oh	Rp 70,714.29	Rp 23,571.43
Kepala tukang	Oh	Rp 70,714.29	Rp 23,571.43
Mandor	Oh	Rp 70,714.29	Rp 23,571.43

Harga tenaga kerja lembur 3 jam = koefisien x harga lembur

Pekerja = 3.66 x Rp.39.285,71 = Rp.143.972,62

Tukang besi = 3,66 x Rp.70.714,29 = Rp.259.150,71

Kepala tukang = 0,37 x Rp.70.714,29 = Rp.25.915,07

Mandor = 0,21 x Rp.70.714,29 = Rp.14.808,61

Maka, total harga tenaga kerja = Rp.143.972,62 + Rp.259.150,71 +
Rp.25.915,07 + Rp.14.808,61

= Rp.443.847,01

Total biaya tenaga kerja percepatan 3 jam/hari

= Biaya normal total /hari + total harga tenaga kerja 3 jam

= Rp.564.896,20 + Rp.443.847,01

$$= \text{Rp}.1.008.743,21$$

Biaya total percepatan 3 Jam

$$= \text{Total harga material} + (\text{Total biaya tenaga kerja percepatan 3 jam} + \text{durasi})$$

$$= \text{Rp}.253.069.830,90 + (\text{Rp}.1.008.743,21 + 10.43)$$

$$= \text{Rp}258.328.173,15$$

Hasil perhitungan diatas merupakan salah satu item kegiatan kritis yang diperoleh dari *Microsoft Project 2010*. Hasil perhitungan keseluruhan biaya dapat dilihat pada Tabel 4.12 sampai 4.15 sebagai berikut ini.

Tabel 4.12 Hasil perhitungan biaya percepatan lembur 1 jam

Kode	Nama Pekerjaan	Biaya	
		Normal	Lembur
BKB	Bekisting Balok Basement	Rp190,091,782	Rp189,363,344
PBB	Pembesian Balok Basement	Rp257,022,076	Rp256,571,948
BTB	Beton Balok Basement	Rp109,955,666	Rp109,349,980
PP	Pembesian Plat A3	Rp150,561,568	Rp150,297,711
BP	Beton Plat A3	Rp90,950,231	Rp90,343,209
BKDPL	Bekisting Dinding Pit Lift	Rp17,035,282	Rp16,986,346
PDPL	Pembesian Dinding Pit Lift	Rp6,308,160	Rp6,291,317
BTDPL	Beton Dinding Pit Lift	Rp6,618,649	Rp6,581,954
BKPB	Bekisting Plat Basement	Rp408,131,777	Rp407,049,491
BKK1	Bekisting Kolom Lt.1	Rp96,378,700	Rp95,968,416
PK1	Pembesian Kolom Lt.1	Rp117,663,848	Rp117,405,849
BTK1	Beton Kolom Lt.1	Rp66,230,312	Rp65,863,583
BKB1	Bekisting Balok Lt.1	Rp185,826,970	Rp185,114,618
BKK2	Bekisting Kolom Lt.2	Rp80,322,294	Rp79,980,447
PK2	Pembesian Kolom Lt.2	Rp93,846,114	Rp93,679,157
BTK2	Beton Kolom Lt.2	Rp55,818,719	Rp55,486,841
BKB2	Bekisting Balok Lt.2	Rp179,468,839	Rp178,782,051
BKK3	Bekisting Kolom Lt.3	Rp65,574,360	Rp65,294,236
PK3	Pembesian Kolom Lt.3	Rp79,438,299	Rp79,296,105
BTK3	Beton Kolom Lt.3	Rp47,391,601	Rp47,130,277
BKB3	Bekisting Balok Lt.3	Rp146,424,005	Rp145,863,876
BKK4	Bekisting Kolom Lt.4	Rp58,629,103	Rp58,379,978
PK4	Pembesian Kolom Lt.4	Rp65,604,089	Rp65,488,729

Lanjutan Tabel 4.12 Hasil Perhitungan Biaya Percepatan Lembur 1 Jam

Kode	Nama Pekerjaan	Biaya	
		Normal	Lembur
BTK4	Beton Kolom Lt.4	Rp37,444,019	Rp37,238,247
BKB4	Bekisting Balok Lt.4	Rp146,424,005	Rp145,863,876
BKK5	Bekisting Kolom Lt.5	Rp58,629,103	Rp58,379,978
PK5	Pembesian Kolom Lt.5	Rp65,604,089	Rp65,488,729
BTK5	Beton Kolom Lt.5	Rp37,444,019	Rp37,237,700
BKB5	Bekisting Balok Lt.5	Rp146,424,005	Rp145,863,876
BKK6	Bekisting Kolom Lt.6	Rp58,629,104	Rp58,379,979
PK6	Pembesian Kolom Lt.6	Rp65,604,089	Rp65,487,444
BTK6	Beton Kolom Lt.6	Rp37,444,019	Rp37,237,475
BKB6	Bekisting Balok Lt.6	Rp146,424,005	Rp145,863,876
PB6	Pembesian Balok Lt.6	Rp214,626,377	Rp214,246,977
BTB6	Beton Balok Lt.6	Rp87,755,446	Rp87,270,884
BKT6	Bekisting Tangga Lt.6	Rp13,988,950	Rp13,934,007
PT6	Pembesian Tangga Lt.6	Rp14,858,480	Rp14,832,800
BTT6	Beton Tangga Lt.6	Rp6,651,554	Rp6,614,859

Tabel 4.13 Hasil perhitungan biaya percepatan lembur 2 jam

Kode	Nama Pekerjaan	Biaya	
		Normal	Lembur
BKB	Bekisting Balok Basement	Rp190,091,782	Rp188,842,201
PBB	Pembesian Balok Basement	Rp257,022,076	Rp256,249,591
BTB	Beton Balok Basement	Rp109,955,666	Rp109,025,080
PP	Pembesian Plat A3	Rp150,561,568	Rp150,109,011
BP	Beton Plat A3	Rp90,950,231	Rp89,994,039
BKDPL	Bekisting Dinding Pit Lift	Rp17,035,282	Rp16,951,260
PDPL	Pembesian Dinding Pit Lift	Rp6,308,160	Rp6,283,622
BTDPL	Beton Dinding Pit Lift	Rp6,618,649	Rp6,555,568
BKPB	Bekisting Plat Basement	Rp408,131,777	Rp406,272,251
BKK1	Bekisting Kolom Lt.1	Rp96,378,700	Rp95,674,948
PK1	Pembesian Kolom Lt.1	Rp117,663,848	Rp117,262,550
BTK1	Beton Kolom Lt.1	Rp66,230,312	Rp65,603,202
BKB1	Bekisting Balok Lt.1	Rp185,826,970	Rp184,605,003
BKK2	Bekisting Kolom Lt.2	Rp80,322,294	Rp79,735,772
PK2	Pembesian Kolom Lt.2	Rp93,846,114	Rp93,561,116
BTK2	Beton Kolom Lt.2	Rp55,818,719	Rp55,289,369
BKB2	Bekisting Balok Lt.2	Rp179,468,839	Rp178,289,253
BKK3	Bekisting Kolom Lt.3	Rp65,574,360	Rp65,094,648

Lanjutan Tabel 4.13 Hasil Perhitungan Biaya Percepatan Lembur 2 Jam

Kode	Nama Pekerjaan	Biaya	
		Normal	Lembur
PK3	Pembesian Kolom Lt.3	Rp79,438,299	Rp79,196,817
BTK3	Beton Kolom Lt3	Rp47,391,601	Rp46,943,073
BKB3	Bekisting Balok Lt.3	Rp146,424,005	Rp145,461,841
BKK4	Bekisting Kolom Lt.4	Rp58,629,103	Rp58,201,604
PK4	Pembesian Kolom Lt.4	Rp65,604,089	Rp65,406,535
BTK4	Beton Kolom Lt.4	Rp37,444,019	Rp37,088,963
BKB4	Bekisting Balok Lt.4	Rp146,424,005	Rp145,461,841
BKK5	Bekisting Kolom Lt.5	Rp58,629,103	Rp58,201,604
PK5	Pembesian Kolom Lt.5	Rp65,604,089	Rp65,406,535
BTK5	Beton Kolom Lt.5	Rp37,444,019	Rp36,944,644
BKB5	Bekisting Balok Lt.5	Rp146,424,005	Rp145,461,841
BKK6	Bekisting Kolom Lt.6	Rp58,629,104	Rp58,201,605
PK6	Pembesian Kolom Lt.6	Rp65,604,089	Rp65,406,535
BTK6	Beton Kolom Lt.6	Rp37,444,019	Rp37,088,963
BKB6	Bekisting Balok Lt.6	Rp146,424,005	Rp144,041,845
PB6	Pembesian Balok Lt.6	Rp214,626,377	Rp213,978,278
BTB6	Beton Balok Lt.6	Rp87,755,446	Rp86,925,574
BKT6	Bekisting Tangga Lt.6	Rp13,988,950	Rp13,894,763
PT6	Pembesian Tangga Lt.6	Rp14,858,480	Rp14,814,276
BTT6	Beton Tangga Lt.6	Rp6,651,554	Rp6,588,473

Tabel 4.14 Hasil perhitungan biaya percepatan lembur 3 jam

Kode	Nama Pekerjaan	Biaya	
		Normal	Lembur
BKB	Bekisting Balok Basement	Rp190,091,782	Rp188,459,131
PBB	Pembesian Balok Basement	Rp257,022,076	Rp256,011,443
BTB	Beton Balok Basement	Rp109,955,666	Rp108,595,596
PP	Pembesian Plat A3	Rp150,561,568	Rp149,969,616
BP	Beton Plat A3	Rp90,950,231	Rp89,737,377
BKDPL	Bekisting Dinding Pit Lift	Rp17,035,282	Rp16,925,474
PDPL	Pembesian Dinding Pit Lift	Rp6,308,160	Rp6,277,846
BDPL	Beton Dinding Pit Lift	Rp6,618,649	Rp6,536,255
BKPB	Bekisting Plat Basement	Rp408,131,777	Rp405,705,887
BKK1	Bekisting Kolom Lt.1	Rp96,378,700	Rp95,459,230
PK1	Pembesian Kolom Lt.1	Rp117,663,848	Rp117,157,563
BTK1	Beton Kolom Lt.1	Rp66,230,312	Rp65,411,236
BKB1	Bekisting Balok Lt.1	Rp185,826,970	Rp184,230,627

Lanjutan Tabel 4.14 Hasil Perhitungan Biaya Percepatan Lembur 3 Jam

Kode	Nama Pekerjaan	Biaya	
		Normal	Lembur
BKK2	Bekisting Kolom Lt.2	Rp80,322,294	Rp79,555,000
PK2	Pembesian Kolom Lt.2	Rp93,846,114	Rp93,474,582
BTK2	Beton Kolom Lt.2	Rp55,818,719	Rp55,128,389
BKB2	Bekisting Balok Lt.2	Rp179,468,839	Rp177,929,811
BKK3	Bekisting Kolom Lt.3	Rp65,574,360	Rp64,948,523
PK3	Pembesian Kolom Lt.3	Rp79,438,299	Rp79,124,128
BTK3	Beton Kolom Lt.3	Rp47,391,601	Rp46,804,757
BKB3	Bekisting Balok Lt.3	Rp146,424,005	Rp145,168,638
BKK4	Bekisting Kolom Lt.4	Rp58,629,103	Rp58,070,738
PK4	Pembesian Kolom Lt.4	Rp65,604,089	Rp65,345,942
BTK4	Beton Kolom Lt.4	Rp37,444,019	Rp36,981,982
BKB4	Bekisting Balok Lt.4	Rp146,424,005	Rp145,168,638
BKK5	Bekisting Kolom Lt.5	Rp58,629,103	Rp58,070,738
PK5	Pembesian Kolom Lt.5	Rp65,604,089	Rp65,345,942
BTK5	Beton Kolom Lt.5	Rp37,444,019	Rp36,846,723
BKB5	Bekisting Balok Lt.5	Rp146,424,005	Rp145,168,638
BKK6	Bekisting Kolom Lt.6	Rp58,629,104	Rp58,070,739
PK6	Pembesian Kolom Lt.6	Rp65,604,089	Rp65,345,942
BTK6	Beton Kolom Lt.6	Rp37,444,019	Rp36,980,252
BKB6	Bekisting Balok Lt.6	Rp146,424,005	Rp145,168,638
PB6	Pembesian Balok Lt.6	Rp214,626,377	Rp213,780,807
BTB6	Beton Balok Lt.6	Rp87,755,446	Rp86,671,238
BKT6	Bekisting Tangga Lt.6	Rp13,988,950	Rp13,774,142
PT6	Pembesian Tangga Lt.6	Rp14,858,480	Rp14,801,021
BTT6	Beton Tangga Lt.6	Rp6,651,554	Rp6,569,160

4.3.5 Analisis Cost Variance, Cost Slope dan Duration Variance

Analisis *cost variance*, *cost slope* dan *duration variance* ini diperlukan sebagai perhitungan biaya langsung, biaya tidak langsung dan biaya total kegiatan proyek. Contoh perhitungan selisih biaya (*cost variance*) antara biaya normal dengan biaya percepatan setiap jam lemburnya adalah sebagai berikut ini.

Nama Kegiatan : Pembesian Balok Basement

Biaya Normal : Rp257.022.076

Biaya Percepatan :

1 Jam = Rp256.571.948

2 Jam = Rp256.249.591

3 Jam = Rp256.011.443

Selisih Biaya (*Cost Variance*)

1 Jam = Rp256.571.948 - Rp257.022.076 = Rp450.128

2 Jam = Rp256.249.591 - Rp257.022.076 = Rp772.485

3 Jam = Rp256.011.443 - Rp257.022.076 = Rp1.010.633

Hasil perhitungan *cost variance* dari seluruh pekerjaan menggunakan *Microsoft Project 2010* dapat dilihat pada Tabel 4.15 hingga 4.17 sebagai berikut ini.

Tabel 4.15 *Cost Variance* dengan waktu lembur 1 Jam

No.	Kegiatan	Cost Variance (Rp)
1	Bekisting Balok Basement	Rp728,438
2	Pembesian Balok Basement	Rp450,128
3	Beton Balok Basement	Rp605,686
4	Pembesian Plat A3	Rp263,857
5	Beton Plat A3	Rp607,022
6	Bekisting Dinding Pit Lift	Rp48,936
7	Pembesian Dinding Pit Lift	Rp16,843
8	Beton Dinding Pit Lift	Rp36,695
9	Bekisting Plat Basement	Rp1,082,286
10	Bekisting Kolom Lt.1	Rp410,284
11	Pembesian Kolom Lt.1	Rp257,999
12	Beton Kolom Lt.1	Rp366,729
13	Bekisting Balok Lt.1	Rp712,352
14	Bekisting Kolom Lt.2	Rp341,847
15	Pembesian Kolom Lt.2	Rp166,957
16	Beton Kolom Lt.2	Rp331,878
17	Bekisting Balok Lt.2	Rp686,788
18	Bekisting Kolom Lt.3	Rp280,124
19	Pembesian Kolom Lt.3	Rp142,194

Lanjutan Tabel 4.15 *Cost Variance* Dengan Waktu Lembur 1 Jam

No.	Kegiatan	Cost Variance (Rp)
20	Beton Kolom Lt.3	Rp261,324
21	Bekisting Balok Lt.3	Rp560,129
22	Bekisting Kolom Lt.4	Rp249,125
23	Pembesian Kolom Lt.4	Rp115,360
24	Beton Kolom Lt.4	Rp205,772
25	Bekisting Balok Lt.4	Rp560,129
26	Bekisting Kolom Lt.5	Rp249,125
27	Pembesian Kolom Lt.5	Rp115,360
28	Beton Kolom Lt.5	Rp206,319
29	Bekisting Balok Lt.5	Rp560,129
30	Bekisting Kolom Lt.6	Rp249,125
31	Pembesian Kolom Lt.6	Rp116,645
32	Beton Kolom Lt.6	Rp206,544
33	Bekisting Balok Lt.6	Rp560,129
34	Pembesian Balok Lt.6	Rp379,400
35	Beton Balok Lt.6	Rp484,562
36	Bekisting Tangga Lt.6	Rp54,943
37	Pembesian Tangga Lt.6	Rp25,680
38	Beton Tangga Lt.6	Rp36,695

Tabel 4.16 *Cost Variance* dengan waktu lembur 2 Jam

No.	Kegiatan	Cost Variance (Rp)
1	Bekisting Balok Basement	Rp1,249,581
2	Pembesian Balok Basement	Rp772,485
3	Beton Balok Basement	Rp930,586
4	Pembesian Plat A3	Rp452,557
5	Beton Plat A3	Rp956,192
6	Bekisting Dinding Pit Lift	Rp84,022
7	Pembesian Dinding Pit Lift	Rp24,538
8	Beton Dinding Pit Lift	Rp63,081
9	Bekisting Plat Basement	Rp1,859,526
10	Bekisting Kolom Lt.1	Rp703,752
11	Pembesian Kolom Lt.1	Rp401,298
12	Beton Kolom Lt.1	Rp627,110
13	Bekisting Balok Lt.1	Rp1,221,967
14	Bekisting Kolom Lt.2	Rp586,522
15	Pembesian Kolom Lt.2	Rp284,998

Lanjutan Tabel 4.16 *Cost Variance* dengan waktu lembur 2 Jam

No.	Kegiatan	Cost Variance (Rp)
16	Beton Kolom Lt.2	Rp529,350
17	Bekisting Balok Lt.2	Rp1,179,586
18	Bekisting Kolom Lt.3	Rp479,712
19	Pembesian Kolom Lt.3	Rp241,482
20	Beton Kolom Lt.3	Rp448,528
21	Bekisting Balok Lt.3	Rp962,164
22	Bekisting Kolom Lt.4	Rp427,499
23	Pembesian Kolom Lt.4	Rp197,554
24	Beton Kolom Lt.4	Rp355,056
25	Bekisting Balok Lt.4	Rp962,164
26	Bekisting Kolom Lt.5	Rp427,499
27	Pembesian Kolom Lt.5	Rp197,554
28	Beton Kolom Lt.5	Rp499,375
29	Bekisting Balok Lt.5	Rp962,164
30	Bekisting Kolom Lt.6	Rp427,499
31	Pembesian Kolom Lt.6	Rp197,554
32	Beton Kolom Lt.6	Rp355,056
33	Bekisting Balok Lt.6	Rp2,382,160
34	Pembesian Balok Lt.6	Rp648,099
35	Beton Balok Lt.6	Rp829,872
36	Bekisting Tangga Lt.6	Rp94,187
37	Pembesian Tangga Lt.6	Rp44,204
38	Beton Tangga Lt.6	Rp63,081

Tabel 4.17 *Cost Variance* dengan waktu lembur 3 Jam

No.	Kegiatan	Cost Variance (Rp)
1	Bekisting Balok Basement	Rp1,632,651
2	Pembesian Balok Basement	Rp1,010,633
3	Beton Balok Basement	Rp1,360,070
4	Pembesian Plat A3	Rp591,952
5	Beton Plat A3	Rp1,212,854
6	Bekisting Dinding Pit Lift	Rp109,808
7	Pembesian Dinding Pit Lift	Rp30,314
8	Beton Dinding Pit Lift	Rp82,394
9	Bekisting Plat Basement	Rp2,425,890
10	Bekisting Kolom Lt.1	Rp919,470

Lanjutan Tabel 4.17 *Cost Variance* dengan waktu lembur 3 Jam

No	Kegiatan	Cost Variance (Rp)
11	Pembesian Kolom Lt.1	Rp506,285
12	Beton Kolom Lt.1	Rp819,076
13	Bekisting Balok Lt.1	Rp1,596,343
14	Bekisting Kolom Lt.2	Rp767,294
15	Pembesian Kolom Lt.2	Rp371,532
16	Beton Kolom Lt.2	Rp690,330
17	Bekisting Balok Lt.2	Rp1,539,028
18	Bekisting Kolom Lt.3	Rp625,837
19	Pembesian Kolom Lt.3	Rp314,171
20	Beton Kolom Lt.3	Rp586,844
21	Bekisting Balok Lt.3	Rp1,255,367
22	Bekisting Kolom Lt.4	Rp558,365
23	Pembesian Kolom Lt.4	Rp258,147
24	Beton Kolom Lt.4	Rp462,037
25	Bekisting Balok Lt.4	Rp1,255,367
26	Bekisting Kolom Lt.5	Rp558,365
27	Pembesian Kolom Lt.5	Rp258,147
28	Beton Kolom Lt.5	Rp597,296
29	Bekisting Balok Lt.5	Rp1,255,367
30	Bekisting Kolom Lt.6	Rp558,365
31	Pembesian Kolom Lt.6	Rp258,147
32	Beton Kolom Lt.6	Rp463,767
33	Bekisting Balok Lt.6	Rp1,255,367
34	Pembesian Balok Lt.6	Rp845,570
35	Beton Balok Lt.6	Rp1,084,208
36	Bekisting Tangga Lt.6	Rp214,808
37	Pembesian Tangga Lt.6	Rp57,459
38	Beton Tangga Lt.6	Rp82,394

Duration Variance adalah selisih antara durasi normal dengan durasi percepatan akibat dilakukannya waktu lembur pada item pekerjaan. Hasil *duration variance* untuk seluruh item pekerjaan menggunakan *Microsoft Project 2010* adalah sebagai berikut ini.

Tabel 4.18 *Duration Variance* dengan waktu lembur 1 Jam

No	Kegiatan	Durasi (Hari)	Durasi Percepatan (Hari)	Durasi Variance (Hari)
1	Bekisting Balok Basement	7	6.20	0.80
2	Pembesian Balok Basement	7	6.20	0.80
3	Beton Balok Basement	5	4.43	0.57
4	Pembesian Plat A3	7	6.20	0.80
5	Beton Plat A3	7	6.20	0.80
6	Bekisting Dinding Pit Lift	7	6.20	0.80
7	Pembesian Dinding Pit Lift	7	6.20	0.80
8	Beton Dinding Pit Lift	5	4.43	0.57
9	Bekisting Plat Basement	14	12.41	1.59
10	Bekisting Kolom Lt.1	7	6.20	0.80
11	Pembesian Kolom Lt.1	7	6.20	0.80
12	Beton Kolom Lt.1	5	4.43	0.57
13	Bekisting Balok Lt.1	14	12.41	1.59
14	Bekisting Kolom Lt.2	7	6.20	0.80
15	Pembesian Kolom Lt.2	7	6.20	0.80
16	Beton Kolom Lt.2	5	4.43	0.57
17	Bekisting Balok Lt.2	14	12.41	1.59
18	Bekisting Kolom Lt.3	7	6.20	0.80
19	Pembesian Kolom Lt.3	7	6.20	0.80
20	Beton Kolom Lt.3	5	4.43	0.57
21	Bekisting Balok Lt.3	14	12.41	1.59
22	Bekisting Kolom Lt.4	7	6.20	0.80
23	Pembesian Kolom Lt.4	7	6.20	0.80
24	Beton Kolom Lt.4	5	4.43	0.57
25	Bekisting Balok Lt.4	14	12.41	1.59
26	Bekisting Kolom Lt.5	7	6.20	0.80
27	Pembesian Kolom Lt.5	7	6.20	0.80
28	Beton Kolom Lt.5	5	4.43	0.57
29	Bekisting Balok Lt.5	14	12.41	1.59
30	Bekisting Kolom Lt.6	7	6.20	0.80
31	Pembesian Kolom Lt.6	7	6.20	0.80
32	Beton Kolom Lt.6	5	4.43	0.57
33	Bekisting Balok Lt.6	14	12.41	1.59
34	Pembesian Balok Lt.6	14	12.41	1.59
35	Beton Balok Lt.6	7	6.20	0.80
36	Bekisting Tangga Lt.6	7	6.20	0.80
37	Pembesian Tangga Lt.6	7	6.20	0.80
38	Beton Tangga Lt.6	5	4.43	0.57

Tabel 4.19 *Duration Variance* dengan waktu lembur 2 Jam

No	Kegiatan	Durasi (Hari)	Durasi Percepatan (Hari)	Durasi Variance (Hari)
1	Bekisting Balok Basement	7	5.63	1.37
2	Pembesian Balok Basement	7	5.63	1.37
3	Beton Balok Basement	5	4.02	0.98
4	Pembesian Plat A3	7	5.63	1.37
5	Beton Plat A3	7	5.63	1.37
6	Bekisting Dinding Pit Lift	7	5.63	1.37
7	Pembesian Dinding Pit Lift	7	5.63	1.37
8	Beton Dinding Pit Lift	5	4.02	0.98
9	Bekisting Plat Basement	14	11.26	2.74
10	Bekisting Kolom Lt.1	7	5.63	1.37
11	Pembesian Kolom Lt.1	7	5.63	1.37
12	Beton Kolom Lt.1	5	4.02	0.98
13	Bekisting Balok Lt.1	14	11.26	2.74
14	Bekisting Kolom Lt.2	7	5.63	1.37
15	Pembesian Kolom Lt.2	7	5.63	1.37
16	Beton Kolom Lt.2	5	4.02	0.98
17	Bekisting Balok Lt.2	14	11.26	2.74
18	Bekisting Kolom Lt.3	7	5.63	1.37
19	Pembesian Kolom Lt.3	7	5.63	1.37
20	Beton Kolom Lt.3	5	4.02	0.98
21	Bekisting Balok Lt.3	14	11.26	2.74
22	Bekisting Kolom Lt.4	7	5.63	1.37
23	Pembesian Kolom Lt.4	7	5.63	1.37
24	Beton Kolom Lt.4	5	4.02	0.98
25	Bekisting Balok Lt.4	14	11.26	2.74
26	Bekisting Kolom Lt.5	7	5.63	1.37
27	Pembesian Kolom Lt.5	7	5.63	1.37
28	Beton Kolom Lt.5	5	4.02	0.98
29	Bekisting Balok Lt.5	14	11.26	2.74
30	Bekisting Kolom Lt.6	7	5.63	1.37
31	Pembesian Kolom Lt.6	7	5.63	1.37
32	Beton Kolom Lt.6	5	4.02	0.98
33	Bekisting Balok Lt.6	14	11.26	2.74
34	Pembesian Balok Lt.6	14	11.26	2.74
35	Beton Balok Lt.6	7	5.63	1.37
36	Bekisting Tangga Lt.6	7	5.63	1.37
37	Pembesian Tangga Lt.6	7	5.63	1.37
38	Beton Tangga Lt.6	5	4.02	0.98

Tabel 4.20 *Duration Variance* dengan waktu lembur 3 Jam

No	Kegiatan	Durasi (Hari)	Durasi Percepatan (Hari)	Durasi Variance (Hari)
1	Bekisting Balok Basement	7	5.21	1.79
2	Pembesian Balok Basement	7	5.21	1.79
3	Beton Balok Basement	5	3.72	1.28
4	Pembesian Plat A3	7	5.21	1.79
5	Beton Plat A3	7	5.21	1.79
6	Bekisting Dinding Pit Lift	7	5.21	1.79
7	Pembesian Dinding Pit Lift	7	5.21	1.79
8	Beton Dinding Pit Lift	5	3.72	1.28
9	Bekisting Plat Basement	14	10.43	3.57
10	Bekisting Kolom Lt.1	7	5.21	1.79
11	Pembesian Kolom Lt.1	7	5.21	1.79
12	Beton Kolom Lt.1	5	3.72	1.28
13	Bekisting Balok Lt.1	14	10.43	3.57
14	Bekisting Kolom Lt.2	7	5.21	1.79
15	Pembesian Kolom Lt.2	7	5.21	1.79
16	Beton Kolom Lt.2	5	3.72	1.28
17	Bekisting Balok Lt.2	14	10.43	3.57
18	Bekisting Kolom Lt.3	7	5.21	1.79
19	Pembesian Kolom Lt.3	7	5.21	1.79
20	Beton Kolom Lt.3	5	3.72	1.28
21	Bekisting Balok Lt.3	14	10.43	3.57
22	Bekisting Kolom Lt.4	7	5.21	1.79
23	Pembesian Kolom Lt.4	7	5.21	1.79
24	Beton Kolom Lt.4	5	3.72	1.28
25	Bekisting Balok Lt.4	14	10.43	3.57
26	Bekisting Kolom Lt.5	7	5.21	1.79
27	Pembesian Kolom Lt.5	7	5.21	1.79
28	Beton Kolom Lt.5	5	3.72	1.28
29	Bekisting Balok Lt.5	14	10.43	3.57
30	Bekisting Kolom Lt.6	7	5.21	1.79
31	Pembesian Kolom Lt.6	7	5.21	1.79
32	Beton Kolom Lt.6	5	3.72	1.28
33	Bekisting Balok Lt.6	14	10.43	3.57
34	Pembesian Balok Lt.6	14	10.43	3.57
35	Beton Balok Lt.6	7	5.21	1.79
36	Bekisting Tangga Lt.6	7	5.21	1.79
37	Pembesian Tangga Lt.6	7	5.21	1.79
38	Beton Tangga Lt.6	5	3.72	1.28

Cost slope merupakan selisih antara biaya normal dengan biaya percepatan perbandingan selisih durasi normal dengan durasi percepatan. Contoh perhitungan perhitungan *cost slope* pada item pekerjaan adalah sebagai berikut ini.

Nama Kegiatan : Pembesian Balok Basement

Cost variance

1 jam = Rp.450.128,00

2 jam = Rp.772.485,00

3 jam = Rp.1.010.633,00

Duration variance

1 jam = 0,80 hari

2 jam = 1,37 hari

3 jam = 1,79 hari

Cost Slope

1 jam = $\frac{\text{Cost variance}}{\text{Duration variance}}$

= $\frac{\text{Rp.450.128,00}}{0,80 \text{ hari}}$

= Rp.564.446,22

2 jam = $\frac{\text{Cost variance}}{\text{Duration variance}}$

= $\frac{\text{Rp.772.485,00}}{1,37 \text{ hari}}$

= Rp.564.757,94

3 jam = $\frac{\text{Cost variance}}{\text{Duration variance}}$

= $\frac{\text{Rp.1.010.633,00}}{1,79 \text{ hari}}$

= Rp.565.473,23

Hasil analisis *cost slope* dari seluruh item kegiatan dengan menggunakan *Microsoft Project 2010* adalah sebagai berikut ini.

Tabel 4.21 *Cost Slope* akibat waktu lembur 1 Jam

No.	Kegiatan	Selisih Durasi (Hari)	Selisih Biaya (Rp)	Cost Slope (Rp./hari)
1	Bekisting Balok Basement	0.80	Rp728,438	Rp913,438
2	Pembesian Balok Basement	0.80	Rp450,128	Rp564,446
3	Beton Balok Basement	0.57	Rp605,686	Rp1,063,315
4	Pembesian Plat A3	0.80	Rp263,857	Rp330,868
5	Beton Plat A3	0.80	Rp607,022	Rp761,186
6	Bekisting Dinding Pit Lift	0.80	Rp48,936	Rp61,364
7	Pembesian Dinding Pit Lift	0.80	Rp16,843	Rp21,121
8	Beton Dinding Pit Lift	0.57	Rp36,695	Rp64,420
9	Bekisting Plat Basement	1.59	Rp1,082,286	Rp678,576
10	Bekisting Kolom Lt.1	0.80	Rp410,284	Rp514,483
11	Pembesian Kolom Lt.1	0.80	Rp257,999	Rp323,523
12	Beton Kolom Lt.1	0.57	Rp366,729	Rp643,813
13	Bekisting Balok Lt.1	1.59	Rp712,352	Rp446,633
14	Bekisting Kolom Lt.2	0.80	Rp341,847	Rp428,665
15	Pembesian Kolom Lt.2	0.80	Rp166,957	Rp209,359
16	Beton Kolom Lt.2	0.57	Rp331,878	Rp582,630
17	Bekisting Balok Lt.2	1.59	Rp686,788	Rp430,605
18	Bekisting Kolom Lt.3	0.80	Rp280,124	Rp351,267
19	Pembesian Kolom Lt.3	0.80	Rp142,194	Rp178,307
20	Beton Kolom Lt.3	0.57	Rp261,324	Rp458,769
21	Bekisting Balok Lt.3	1.59	Rp560,129	Rp351,192
22	Bekisting Kolom Lt.4	0.80	Rp249,125	Rp312,395
23	Pembesian Kolom Lt.4	0.80	Rp115,360	Rp144,658
24	Beton Kolom Lt.4	0.57	Rp205,772	Rp361,244
25	Bekisting Balok Lt.4	1.59	Rp560,129	Rp351,192
26	Bekisting Kolom Lt.5	0.80	Rp249,125	Rp312,395
27	Pembesian Kolom Lt.5	0.80	Rp115,360	Rp144,658
28	Beton Kolom Lt.5	0.57	Rp206,319	Rp362,204
29	Bekisting Balok Lt.5	1.59	Rp560,129	Rp351,192
30	Bekisting Kolom Lt.6	0.80	Rp249,125	Rp312,395
31	Pembesian Kolom Lt.6	0.80	Rp116,645	Rp146,269
32	Beton Kolom Lt.6	0.57	Rp206,544	Rp362,599
33	Bekisting Balok Lt.6	1.59	Rp560,129	Rp351,192
34	Pembesian Balok Lt.6	1.59	Rp379,400	Rp237,878
35	Beton Balok Lt.6	0.80	Rp484,562	Rp607,625
36	Bekisting Tangga Lt.6	0.80	Rp54,943	Rp68,897
37	Pembesian Tangga Lt.6	0.80	Rp25,680	Rp32,202
38	Beton Tangga Lt.6	0.57	Rp36,695	Rp64,420

Tabel 4.22 *Cost Slope* akibat waktu lembur 2 Jam

No.	Kegiatan	Selisih Durasi (Hari)	Selisih Biaya (Rp)	Cost Slope (Rp./hari)
1	Bekisting Balok Basement	1.37	Rp1,249,581	Rp913,559
2	Pembesian Balok Basement	1.37	Rp772,485	Rp564,758
3	Beton Balok Basement	0.98	Rp930,586	Rp952,482
4	Pembesian Plat A3	1.37	Rp452,557	Rp330,861
5	Beton Plat A3	1.37	Rp956,192	Rp699,065
6	Bekisting Dinding Pit Lift	1.37	Rp84,022	Rp61,428
7	Pembesian Dinding Pit Lift	1.37	Rp24,538	Rp17,940
8	Beton Dinding Pit Lift	0.98	Rp63,081	Rp64,565
9	Bekisting Plat Basement	2.74	Rp1,859,526	Rp679,743
10	Bekisting Kolom Lt.1	1.37	Rp703,752	Rp514,508
11	Pembesian Kolom Lt.1	1.37	Rp401,298	Rp293,386
12	Beton Kolom Lt.1	0.98	Rp627,110	Rp641,866
13	Bekisting Balok Lt.1	2.74	Rp1,221,967	Rp446,685
14	Bekisting Kolom Lt.2	1.37	Rp586,522	Rp428,802
15	Pembesian Kolom Lt.2	1.37	Rp284,998	Rp208,360
16	Beton Kolom Lt.2	0.98	Rp529,350	Rp541,805
17	Bekisting Balok Lt.2	2.74	Rp1,179,586	Rp431,193
18	Bekisting Kolom Lt.3	1.37	Rp479,712	Rp350,714
19	Pembesian Kolom Lt.3	1.37	Rp241,482	Rp176,546
20	Beton Kolom Lt.3	0.98	Rp448,528	Rp459,082
21	Bekisting Balok Lt.3	2.74	Rp962,164	Rp351,715
22	Bekisting Kolom Lt.4	1.37	Rp427,499	Rp312,541
23	Pembesian Kolom Lt.4	1.37	Rp197,554	Rp144,430
24	Beton Kolom Lt.4	0.98	Rp355,056	Rp363,410
25	Bekisting Balok Lt.4	2.74	Rp962,164	Rp351,715
26	Bekisting Kolom Lt.5	1.37	Rp427,499	Rp312,541
27	Pembesian Kolom Lt.5	1.37	Rp197,554	Rp144,430
28	Beton Kolom Lt.5	0.98	Rp499,375	Rp511,125
29	Bekisting Balok Lt.5	2.74	Rp962,164	Rp351,715
30	Bekisting Kolom Lt.6	1.37	Rp427,499	Rp312,541
31	Pembesian Kolom Lt.6	1.37	Rp197,554	Rp144,430
32	Beton Kolom Lt.6	0.98	Rp355,056	Rp363,410
33	Bekisting Balok Lt.6	2.74	Rp2,382,160	Rp870,790
34	Pembesian Balok Lt.6	2.74	Rp648,099	Rp236,910
35	Beton Balok Lt.6	1.37	Rp829,872	Rp606,713
36	Bekisting Tangga Lt.6	1.37	Rp94,187	Rp68,859
37	Pembesian Tangga Lt.6	1.37	Rp44,204	Rp32,317
38	Beton Tangga Lt.6	0.98	Rp63,081	Rp64,565

Tabel 4.23 *Cost Slope* akibat waktu lembur 3 Jam

No.	Kegiatan	Selisih Durasi (Hari)	Selisih Biaya (Rp)	Cost Slope (Rp./hari)
1	Bekisting Balok Basement	1.79	Rp1,632,651	Rp913,507
2	Pembesian Balok Basement	1.79	Rp1,010,633	Rp565,473
3	Beton Balok Basement	1.28	Rp1,360,070	Rp1,065,388
4	Pembesian Plat A3	1.79	Rp591,952	Rp331,211
5	Beton Plat A3	1.79	Rp1,212,854	Rp678,621
6	Bekisting Dinding Pit Lift	1.79	Rp109,808	Rp61,440
7	Pembesian Dinding Pit Lift	1.79	Rp30,314	Rp16,961
8	Beton Dinding Pit Lift	1.28	Rp82,394	Rp64,542
9	Bekisting Plat Basement	3.57	Rp2,425,890	Rp678,672
10	Bekisting Kolom Lt.1	1.79	Rp919,470	Rp514,465
11	Pembesian Kolom Lt.1	1.79	Rp506,285	Rp283,279
12	Beton Kolom Lt.1	1.28	Rp819,076	Rp641,610
13	Bekisting Balok Lt.1	3.57	Rp1,596,343	Rp446,596
14	Bekisting Kolom Lt.2	1.79	Rp767,294	Rp429,319
15	Pembesian Kolom Lt.2	1.79	Rp371,532	Rp207,881
16	Beton Kolom Lt.2	1.28	Rp690,330	Rp540,759
17	Bekisting Balok Lt.2	3.57	Rp1,539,028	Rp430,561
18	Bekisting Kolom Lt.3	1.79	Rp625,837	Rp350,171
19	Pembesian Kolom Lt.3	1.79	Rp314,171	Rp175,786
20	Beton Kolom Lt.3	1.28	Rp586,844	Rp459,694
21	Bekisting Balok Lt.3	3.57	Rp1,255,367	Rp351,204
22	Bekisting Kolom Lt.4	1.79	Rp558,365	Rp312,419
23	Pembesian Kolom Lt.4	1.79	Rp258,147	Rp144,439
24	Beton Kolom Lt.4	1.28	Rp462,037	Rp361,929
25	Bekisting Balok Lt.4	3.57	Rp1,255,367	Rp351,204
26	Bekisting Kolom Lt.5	1.79	Rp558,365	Rp312,419
27	Pembesian Kolom Lt.5	1.79	Rp258,147	Rp144,439
28	Beton Kolom Lt.5	1.28	Rp597,296	Rp467,882
29	Bekisting Balok Lt.5	3.57	Rp1,255,367	Rp351,204
30	Bekisting Kolom Lt.6	1.79	Rp558,365	Rp312,419
31	Pembesian Kolom Lt.6	1.79	Rp258,147	Rp144,439
32	Beton Kolom Lt.6	1.28	Rp463,767	Rp363,284
33	Bekisting Balok Lt.6	3.57	Rp1,255,367	Rp351,204
34	Pembesian Balok Lt.6	3.57	Rp845,570	Rp236,558
35	Beton Balok Lt.6	1.79	Rp1,084,208	Rp606,640
36	Bekisting Tangga Lt.6	1.79	Rp214,808	Rp120,190
37	Pembesian Tangga Lt.6	1.79	Rp57,459	Rp32,150
38	Beton Tangga Lt.6	1.28	Rp82,394	Rp64,542

Tabel 4.24 *Cost Slope* dari terkecil ke terbesar dengan waktu lembur 1 jam

Kode	Durasi (Hari)			Biaya		Cost Variance	Slope
	Normal	Crash	Selisih	Normal	Crash		
PDPL	6.20	7	0.80	Rp6,308,160	Rp6,291,317	Rp16,843	Rp21,121
PT6	6.20	7	0.80	Rp14,858,480	Rp14,832,800	Rp25,680	Rp32,202
BKDPL	6.20	7	0.80	Rp17,035,282	Rp16,986,346	Rp48,936	Rp61,364
BDTDL	4.43	5	0.57	Rp6,618,649	Rp6,581,954	Rp36,695	Rp64,420
BTT6	4.43	5	0.57	Rp6,651,554	Rp6,614,859	Rp36,695	Rp64,420
BKT6	6.20	7	0.80	Rp13,988,950	Rp13,934,007	Rp54,943	Rp68,897
PK4	6.20	7	0.80	Rp65,604,089	Rp65,488,729	Rp115,360	Rp144,658
PK5	6.20	7	0.80	Rp65,604,089	Rp65,488,729	Rp115,360	Rp144,658
PK6	6.20	7	0.80	Rp65,604,089	Rp65,487,444	Rp116,645	Rp146,269
PK3	6.20	7	0.80	Rp79,438,299	Rp79,296,105	Rp142,194	Rp178,307
PK2	6.20	7	0.80	Rp93,846,114	Rp93,679,157	Rp166,957	Rp209,359
PB6	12.41	14	1.59	Rp214,626,377	Rp214,246,977	Rp379,400	Rp237,878
BKK4	6.20	7	0.80	Rp58,629,103	Rp58,379,978	Rp249,125	Rp312,395
BKK5	6.20	7	0.80	Rp58,629,103	Rp58,379,978	Rp249,125	Rp312,395
BKK6	6.20	7	0.80	Rp58,629,104	Rp58,379,979	Rp249,125	Rp312,395
PK1	6.20	7	0.80	Rp117,663,848	Rp117,405,849	Rp257,999	Rp323,523
PP	6.20	7	0.80	Rp150,561,568	Rp150,297,711	Rp263,857	Rp330,868
BKB6	12.41	14	1.59	Rp146,424,005	Rp145,863,876	Rp560,129	Rp351,192
BKB3	12.41	14	1.59	Rp146,424,005	Rp145,863,876	Rp560,129	Rp351,192
BKB4	12.41	14	1.59	Rp146,424,005	Rp145,863,876	Rp560,129	Rp351,192
BKB5	12.41	14	1.59	Rp146,424,005	Rp145,863,876	Rp560,129	Rp351,192
BKK3	6.20	7	0.80	Rp65,574,360	Rp65,294,236	Rp280,124	Rp351,267
BTK4	4.43	5	0.57	Rp37,444,019	Rp37,238,247	Rp205,772	Rp361,244
BTK5	4.43	5	0.57	Rp37,444,019	Rp37,237,700	Rp206,319	Rp362,204
BTK6	4.43	5	0.57	Rp37,444,019	Rp37,237,475	Rp206,544	Rp362,599
BKK2	6.20	7	0.80	Rp80,322,294	Rp79,980,447	Rp341,847	Rp428,665
BKB2	12.41	14	1.59	Rp179,468,839	Rp178,782,051	Rp686,788	Rp430,605
BKB1	12.41	14	1.59	Rp185,826,970	Rp185,114,618	Rp712,352	Rp446,633
BTK3	4.43	5	0.57	Rp47,391,601	Rp47,130,277	Rp261,324	Rp458,769
BKK1	6.20	7	0.80	Rp96,378,700	Rp95,968,416	Rp410,284	Rp514,483
PBB	6.20	7	0.80	Rp257,022,076	Rp256,571,948	Rp450,128	Rp564,446
BTK2	4.43	5	0.57	Rp55,818,719	Rp55,486,841	Rp331,878	Rp582,630
BTB6	6.20	7	0.80	Rp87,755,446	Rp87,270,884	Rp484,562	Rp607,625
BTK1	4.43	5	0.57	Rp66,230,312	Rp65,863,583	Rp366,729	Rp643,813
BKPB	12.41	14	1.59	Rp408,131,777	Rp407,049,491	Rp1,082,286	Rp678,576
BP	6.20	7	0.80	Rp90,950,231	Rp90,343,209	Rp607,022	Rp761,186
BKB	6.20	7	0.80	Rp190,091,782	Rp189,363,344	Rp728,438	Rp913,438
BTB	4.43	5	0.57	Rp109,955,666	Rp109,349,980	Rp605,686	Rp1,063,315

Tabel 4.25 *Cost Slope* dari terkecil ke terbesar dengan waktu lembur 2 jam

Kode	Durasi (Hari)			Biaya		Cost Variance	Slope
	Normal	Crash	Selisih	Normal	Crash		
PDPL	5.63	7	1.37	Rp6,308,160	Rp6,283,622	Rp24,538	Rp17,940
PT6	5.63	7	1.37	Rp14,858,480	Rp14,814,276	Rp44,204	Rp32,317
BKDPL	5.63	7	1.37	Rp17,035,282	Rp16,951,260	Rp84,022	Rp61,428
BTDPL	4.02	5	0.98	Rp6,618,649	Rp6,555,568	Rp63,081	Rp64,565
BTT6	4.02	5	0.98	Rp6,651,554	Rp6,588,473	Rp63,081	Rp64,565
BKT6	5.63	7	1.37	Rp13,988,950	Rp13,894,763	Rp94,187	Rp68,859
PK4	5.63	7	1.37	Rp65,604,089	Rp65,406,535	Rp197,554	Rp144,430
PK5	5.63	7	1.37	Rp65,604,089	Rp65,406,535	Rp197,554	Rp144,430
PK6	5.63	7	1.37	Rp65,604,089	Rp65,406,535	Rp197,554	Rp144,430
PK3	5.63	7	1.37	Rp79,438,299	Rp79,196,817	Rp241,482	Rp176,546
PK2	5.63	7	1.37	Rp93,846,114	Rp93,561,116	Rp284,998	Rp208,360
PB6	11.26	14	2.74	Rp214,626,377	Rp213,978,278	Rp648,099	Rp236,910
PK1	5.63	7	1.37	Rp117,663,848	Rp117,262,550	Rp401,298	Rp293,386
BKK4	5.63	7	1.37	Rp58,629,103	Rp58,201,604	Rp427,499	Rp312,541
BKK5	5.63	7	1.37	Rp58,629,103	Rp58,201,604	Rp427,499	Rp312,541
BKK6	5.63	7	1.37	Rp58,629,104	Rp58,201,605	Rp427,499	Rp312,541
PP	5.63	7	1.37	Rp150,561,568	Rp150,109,011	Rp452,557	Rp330,861
BKK3	5.63	7	1.37	Rp65,574,360	Rp65,094,648	Rp479,712	Rp350,714
BKB3	11.26	14	2.74	Rp146,424,005	Rp145,461,841	Rp962,164	Rp351,715
BKB4	11.26	14	2.74	Rp146,424,005	Rp145,461,841	Rp962,164	Rp351,715
BKB5	11.26	14	2.74	Rp146,424,005	Rp145,461,841	Rp962,164	Rp351,715
BTK4	4.02	5	0.98	Rp37,444,019	Rp37,088,963	Rp355,056	Rp363,410
BTK6	4.02	5	0.98	Rp37,444,019	Rp37,088,963	Rp355,056	Rp363,410
BKK2	5.63	7	1.37	Rp80,322,294	Rp79,735,772	Rp586,522	Rp428,802
BKB2	11.26	14	2.74	Rp179,468,839	Rp178,289,253	Rp1,179,586	Rp431,193
BKB1	11.26	14	2.74	Rp185,826,970	Rp184,605,003	Rp1,221,967	Rp446,685
BTK3	4.02	5	0.98	Rp47,391,601	Rp46,943,073	Rp448,528	Rp459,082
BTK5	4.02	5	0.98	Rp37,444,019	Rp36,944,644	Rp499,375	Rp511,125
BKK1	5.63	7	1.37	Rp96,378,700	Rp95,674,948	Rp703,752	Rp514,508
PBB	5.63	7	1.37	Rp257,022,076	Rp256,249,591	Rp772,485	Rp564,758
BTK2	4.02	5	0.98	Rp55,818,719	Rp55,289,369	Rp529,350	Rp541,805
BTB6	5.63	7	1.37	Rp87,755,446	Rp86,925,574	Rp829,872	Rp606,713
BTK1	4.02	5	0.98	Rp66,230,312	Rp65,603,202	Rp627,110	Rp641,866
BKPB	11.26	14	2.74	Rp408,131,777	Rp406,272,251	Rp1,859,526	Rp679,743
BP	5.63	7	1.37	Rp90,950,231	Rp89,994,039	Rp956,192	Rp699,065
BKB6	11.26	14	2.74	Rp146,424,005	Rp144,041,845	Rp2,382,160	Rp870,790
BKB	5.63	7	1.37	Rp190,091,782	Rp188,842,201	Rp1,249,581	Rp913,559
BTB	4.02	5	0.98	Rp109,955,666	Rp109,025,080	Rp930,586	Rp952,482

Tabel 4.26 *Cost Slope* dari terkecil ke terbesar dengan waktu lembur 3 jam

Kode	Durasi (Hari)			Biaya		Cost Variance	Slope
	Normal	Crash	Selisih	Normal	Crash		
PDPL	5.21	7	1.79	Rp6,308,160	Rp6,277,846	Rp30,314	Rp16,961
PT6	5.21	7	1.79	Rp14,858,480	Rp14,801,021	Rp57,459	Rp32,150
BKDPL	5.21	7	1.79	Rp17,035,282	Rp16,925,474	Rp109,808	Rp61,440
BTDPL	3.72	5	1.28	Rp6,618,649	Rp6,536,255	Rp82,394	Rp64,542
BTT6	3.72	5	1.28	Rp6,651,554	Rp6,569,160	Rp82,394	Rp64,542
BKT6	5.21	7	1.79	Rp13,988,950	Rp13,774,142	Rp214,808	Rp120,190
PK4	5.21	7	1.79	Rp65,604,089	Rp65,345,942	Rp258,147	Rp144,439
PK5	5.21	7	1.79	Rp65,604,089	Rp65,345,942	Rp258,147	Rp144,439
PK6	5.21	7	1.79	Rp65,604,089	Rp65,345,942	Rp258,147	Rp144,439
PK3	5.21	7	1.79	Rp79,438,299	Rp79,124,128	Rp314,171	Rp175,786
PK2	5.21	7	1.79	Rp93,846,114	Rp93,474,582	Rp371,532	Rp207,881
PB6	10.43	14	3.57	Rp214,626,377	Rp213,780,807	Rp845,570	Rp236,558
PK1	5.21	7	1.79	Rp117,663,848	Rp117,157,563	Rp506,285	Rp283,279
BKK4	5.21	7	1.79	Rp58,629,103	Rp58,070,738	Rp558,365	Rp312,419
BKK5	5.21	7	1.79	Rp58,629,103	Rp58,070,738	Rp558,365	Rp312,419
BKK6	5.21	7	1.79	Rp58,629,104	Rp58,070,739	Rp558,365	Rp312,419
PP	5.21	7	1.79	Rp150,561,568	Rp149,969,616	Rp591,952	Rp331,211
BKB6	10.43	14	3.57	Rp146,424,005	Rp145,168,638	Rp1,255,367	Rp351,204
BKB3	10.43	14	3.57	Rp146,424,005	Rp145,168,638	Rp1,255,367	Rp351,204
BKB4	10.43	14	3.57	Rp146,424,005	Rp145,168,638	Rp1,255,367	Rp351,204
BKB5	10.43	14	3.57	Rp146,424,005	Rp145,168,638	Rp1,255,367	Rp351,204
BKK3	5.21	7	1.79	Rp65,574,360	Rp64,948,523	Rp625,837	Rp350,171
BTK4	3.72	5	1.28	Rp37,444,019	Rp36,981,982	Rp462,037	Rp361,929
BTK6	3.72	5	1.28	Rp37,444,019	Rp36,980,252	Rp463,767	Rp363,284
BKK2	5.21	7	1.79	Rp80,322,294	Rp79,555,000	Rp767,294	Rp429,319
BKB2	10.43	14	3.57	Rp179,468,839	Rp177,929,811	Rp1,539,028	Rp430,561
BKB1	10.43	14	3.57	Rp185,826,970	Rp184,230,627	Rp1,596,343	Rp446,596
BTK3	3.72	5	1.28	Rp47,391,601	Rp46,804,757	Rp586,844	Rp459,694
BTK5	3.72	5	1.28	Rp37,444,019	Rp36,846,723	Rp597,296	Rp467,882
BKK1	5.21	7	1.79	Rp96,378,700	Rp95,459,230	Rp919,470	Rp514,465
PBB	5.21	7	1.79	Rp257,022,076	Rp256,011,443	Rp1,010,633	Rp565,473
BTK2	3.72	5	1.28	Rp55,818,719	Rp55,128,389	Rp690,330	Rp540,759
BTB6	5.21	7	1.79	Rp87,755,446	Rp86,671,238	Rp1,084,208	Rp606,640
BTK1	3.72	5	1.28	Rp66,230,312	Rp65,411,236	Rp819,076	Rp641,610
BKPB	10.43	14	3.57	Rp408,131,777	Rp405,705,887	Rp2,425,890	Rp678,672
BP	5.21	7	1.79	Rp90,950,231	Rp89,737,377	Rp1,212,854	Rp678,621
BKB	5.21	7	1.79	Rp190,091,782	Rp188,459,131	Rp1,632,651	Rp913,507
BTB	3.72	5	1.28	Rp109,955,666	Rp108,595,596	Rp1,360,070	Rp1,065,388

Tabel 4.27 *Cost Variance* dari terkecil ke terbesar dengan waktu lembur 1 jam

Kode	Durasi (Hari)			Biaya		<i>Cost Variance</i> (Rp)	<i>Slope</i>
	<i>Crash</i>	Normal	Selisih	Normal	<i>Crash</i>		
PDPL	6.20	7	0.80	Rp6,308,160	Rp6,291,317	Rp16,843	Rp21,121
PT6	6.20	7	0.80	Rp14,858,480	Rp14,832,800	Rp25,680	Rp32,202
BTDPL	4.43	5	0.57	Rp6,618,649	Rp6,581,954	Rp36,695	Rp64,420
BTT6	4.43	5	0.57	Rp6,651,554	Rp6,614,859	Rp36,695	Rp64,420
BKDPL	6.20	7	0.80	Rp17,035,282	Rp16,986,346	Rp48,936	Rp61,364
BKT6	6.20	7	0.80	Rp13,988,950	Rp13,934,007	Rp54,943	Rp68,897
PK4	6.20	7	0.80	Rp65,604,089	Rp65,488,729	Rp115,360	Rp144,658
PK5	6.20	7	0.80	Rp65,604,089	Rp65,488,729	Rp115,360	Rp144,658
PK6	6.20	7	0.80	Rp65,604,089	Rp65,487,444	Rp116,645	Rp146,269
PK3	6.20	7	0.80	Rp79,438,299	Rp79,296,105	Rp142,194	Rp178,307
PK2	6.20	7	0.80	Rp93,846,114	Rp93,679,157	Rp166,957	Rp209,359
BTK4	4.43	5	0.57	Rp37,444,019	Rp37,238,247	Rp205,772	Rp361,244
BTK5	4.43	5	0.57	Rp37,444,019	Rp37,237,700	Rp206,319	Rp362,204
BTK6	4.43	5	0.57	Rp37,444,019	Rp37,237,475	Rp206,544	Rp362,599
BKK4	6.20	7	0.80	Rp58,629,103	Rp58,379,978	Rp249,125	Rp312,395
BKK5	6.20	7	0.80	Rp58,629,103	Rp58,379,978	Rp249,125	Rp312,395
BKK6	6.20	7	0.80	Rp58,629,104	Rp58,379,979	Rp249,125	Rp312,395
PK1	6.20	7	0.80	Rp117,663,848	Rp117,405,849	Rp257,999	Rp323,523
BTK3	4.43	5	0.57	Rp47,391,601	Rp47,130,277	Rp261,324	Rp458,769
PP	6.20	7	0.80	Rp150,561,568	Rp150,297,711	Rp263,857	Rp330,868
BKK3	6.20	7	0.80	Rp65,574,360	Rp65,294,236	Rp280,124	Rp351,267
BTK2	4.43	5	0.57	Rp55,818,719	Rp55,486,841	Rp331,878	Rp582,630
BKK2	6.20	7	0.80	Rp80,322,294	Rp79,980,447	Rp341,847	Rp428,665
BTK1	4.43	5	0.57	Rp66,230,312	Rp65,863,583	Rp366,729	Rp643,813
PB6	12.41	14	1.59	Rp214,626,377	Rp214,246,977	Rp379,400	Rp237,878
BKK1	6.20	7	0.80	Rp96,378,700	Rp95,968,416	Rp410,284	Rp514,483
PBB	6.20	7	0.80	Rp257,022,076	Rp256,571,948	Rp450,128	Rp564,446
BTB6	6.20	7	0.80	Rp87,755,446	Rp87,270,884	Rp484,562	Rp607,625
BKB3	12.41	14	1.59	Rp146,424,005	Rp145,863,876	Rp560,129	Rp351,192
BKB4	12.41	14	1.59	Rp146,424,005	Rp145,863,876	Rp560,129	Rp351,192
BKB5	12.41	14	1.59	Rp146,424,005	Rp145,863,876	Rp560,129	Rp351,192
BKB6	12.41	14	1.59	Rp146,424,005	Rp145,863,876	Rp560,129	Rp351,192
BTB	4.43	5	0.57	Rp109,955,666	Rp109,349,980	Rp605,686	Rp1,063,315
BP	6.20	7	0.80	Rp90,950,231	Rp90,343,209	Rp607,022	Rp761,186
BKB2	12.41	14	1.59	Rp179,468,839	Rp178,782,051	Rp686,788	Rp430,605
BKB1	12.41	14	1.59	Rp185,826,970	Rp185,114,618	Rp712,352	Rp446,633
BKB	6.20	7	0.80	Rp190,091,782	Rp189,363,344	Rp728,438	Rp913,438
BKPB	12.41	14	1.59	Rp408,131,777	Rp407,049,491	Rp1,082,286	Rp678,576

Tabel 4.28 *Cost Variance* dari terkecil ke terbesar dengan waktu lembur 2 jam

Kode	Durasi (Hari)			Biaya		<i>Cost Variance</i> (Rp)	<i>Slope</i>
	<i>Crash</i>	Normal	Selisih	Normal	<i>Crash</i>		
PDPL	5.63	7	1.37	Rp6,308,160	Rp6,283,622	Rp24,538	Rp17,940
PT6	5.63	7	1.37	Rp14,858,480	Rp14,814,276	Rp44,204	Rp32,317
BTDPL	4.02	5	0.98	Rp6,618,649	Rp6,555,568	Rp63,081	Rp64,565
BTT6	4.02	5	0.98	Rp6,651,554	Rp6,588,473	Rp63,081	Rp64,565
BKDPL	5.63	7	1.37	Rp17,035,282	Rp16,951,260	Rp84,022	Rp61,428
BKT6	5.63	7	1.37	Rp13,988,950	Rp13,894,763	Rp94,187	Rp68,859
PK4	5.63	7	1.37	Rp65,604,089	Rp65,406,535	Rp197,554	Rp144,430
PK5	5.63	7	1.37	Rp65,604,089	Rp65,406,535	Rp197,554	Rp144,430
PK6	5.63	7	1.37	Rp65,604,089	Rp65,406,535	Rp197,554	Rp144,430
PK3	5.63	7	1.37	Rp79,438,299	Rp79,196,817	Rp241,482	Rp176,546
PK2	5.63	7	1.37	Rp93,846,114	Rp93,561,116	Rp284,998	Rp208,360
BTK4	4.02	5	0.98	Rp37,444,019	Rp37,088,963	Rp355,056	Rp363,410
BTK5	4.02	5	0.98	Rp37,444,019	Rp36,944,644	Rp499,375	Rp511,125
BTK6	4.02	5	0.98	Rp37,444,019	Rp37,088,963	Rp355,056	Rp363,410
BKK4	5.63	7	1.37	Rp58,629,103	Rp58,201,604	Rp427,499	Rp312,541
BKK5	5.63	7	1.37	Rp58,629,103	Rp58,201,604	Rp427,499	Rp312,541
BKK6	5.63	7	1.37	Rp58,629,104	Rp58,201,605	Rp427,499	Rp312,541
PK1	5.63	7	1.37	Rp117,663,848	Rp117,262,550	Rp401,298	Rp293,386
BTK3	4.02	5	0.98	Rp47,391,601	Rp46,943,073	Rp448,528	Rp459,082
PP	5.63	7	1.37	Rp150,561,568	Rp150,109,011	Rp452,557	Rp330,861
BKK3	5.63	7	1.37	Rp65,574,360	Rp65,094,648	Rp479,712	Rp350,714
BTK2	4.02	5	0.98	Rp55,818,719	Rp55,289,369	Rp529,350	Rp541,805
BKK2	5.63	7	1.37	Rp80,322,294	Rp79,735,772	Rp586,522	Rp428,802
BTK1	4.02	5	0.98	Rp66,230,312	Rp65,603,202	Rp627,110	Rp641,866
PB6	11.26	14	2.74	Rp214,626,377	Rp213,978,278	Rp648,099	Rp236,910
BKK1	5.63	7	1.37	Rp96,378,700	Rp95,674,948	Rp703,752	Rp514,508
PBB	5.63	7	1.37	Rp257,022,076	Rp256,249,591	Rp772,485	Rp564,758
BTB6	5.63	7	1.37	Rp87,755,446	Rp86,925,574	Rp829,872	Rp606,713
BKB3	11.26	14	2.74	Rp146,424,005	Rp145,461,841	Rp962,164	Rp351,715
BKB4	11.26	14	2.74	Rp146,424,005	Rp145,461,841	Rp962,164	Rp351,715
BKB5	11.26	14	2.74	Rp146,424,005	Rp145,461,841	Rp962,164	Rp351,715
BKB6	11.26	14	2.74	Rp146,424,005	Rp144,041,845	Rp2,382,160	Rp870,790
BTB	4.02	5	0.98	Rp109,955,666	Rp109,025,080	Rp930,586	Rp952,482
BP	5.63	7	1.37	Rp90,950,231	Rp89,994,039	Rp956,192	Rp699,065
BKB2	11.26	14	2.74	Rp179,468,839	Rp178,289,253	Rp1,179,586	Rp431,193
BKB1	11.26	14	2.74	Rp185,826,970	Rp184,605,003	Rp1,221,967	Rp446,685
BKB	5.63	7	1.37	Rp190,091,782	Rp188,842,201	Rp1,249,581	Rp913,559
BKPB	11.26	14	2.74	Rp408,131,777	Rp406,272,251	Rp1,859,526	Rp679,743

Tabel 4.29 *Cost Variance* dari terkecil ke terbesar dengan waktu lembur 3 jam

Kode	Durasi (Hari)			Biaya		<i>Cost Variance</i> (Rp)	<i>Slope</i>
	<i>Crash</i>	Normal	Selisih	Normal	<i>Crash</i>		
PDPL	5.21	7	1.79	Rp6,308,160	Rp6,277,846	Rp30,314	Rp16,961
PT6	5.21	7	1.79	Rp14,858,480	Rp14,801,021	Rp57,459	Rp32,150
BTDPL	3.72	5	1.28	Rp6,618,649	Rp6,536,255	Rp82,394	Rp64,542
BTT6	3.72	5	1.28	Rp6,651,554	Rp6,569,160	Rp82,394	Rp64,542
BKDPL	5.21	7	1.79	Rp17,035,282	Rp16,925,474	Rp109,808	Rp61,440
BKT6	5.21	7	1.79	Rp13,988,950	Rp13,774,142	Rp214,808	Rp120,190
PK4	5.21	7	1.79	Rp65,604,089	Rp65,345,942	Rp258,147	Rp144,439
PK5	5.21	7	1.79	Rp65,604,089	Rp65,345,942	Rp258,147	Rp144,439
PK6	5.21	7	1.79	Rp65,604,089	Rp65,345,942	Rp258,147	Rp144,439
PK3	5.21	7	1.79	Rp79,438,299	Rp79,124,128	Rp314,171	Rp175,786
PK2	5.21	7	1.79	Rp93,846,114	Rp93,474,582	Rp371,532	Rp207,881
BTK4	3.72	5	1.28	Rp37,444,019	Rp36,981,982	Rp462,037	Rp361,929
BTK5	3.72	5	1.28	Rp37,444,019	Rp36,846,723	Rp597,296	Rp467,882
BTK6	3.72	5	1.28	Rp37,444,019	Rp36,980,252	Rp463,767	Rp363,284
BKK4	5.21	7	1.79	Rp58,629,103	Rp58,070,738	Rp558,365	Rp312,419
BKK5	5.21	7	1.79	Rp58,629,103	Rp58,070,738	Rp558,365	Rp312,419
BKK6	5.21	7	1.79	Rp58,629,104	Rp58,070,739	Rp558,365	Rp312,419
PK1	5.21	7	1.79	Rp117,663,848	Rp117,157,563	Rp506,285	Rp283,279
BTK3	3.72	5	1.28	Rp47,391,601	Rp46,804,757	Rp586,844	Rp459,694
PP	5.21	7	1.79	Rp150,561,568	Rp149,969,616	Rp591,952	Rp331,211
BKK3	5.21	7	1.79	Rp65,574,360	Rp64,948,523	Rp625,837	Rp350,171
BTK2	3.72	5	1.28	Rp55,818,719	Rp55,128,389	Rp690,330	Rp540,759
BKK2	5.21	7	1.79	Rp80,322,294	Rp79,555,000	Rp767,294	Rp429,319
BTK1	3.72	5	1.28	Rp66,230,312	Rp65,411,236	Rp819,076	Rp641,610
PB6	10.43	14	3.57	Rp214,626,377	Rp213,780,807	Rp845,570	Rp236,558
BKK1	5.21	7	1.79	Rp96,378,700	Rp95,459,230	Rp919,470	Rp514,465
PBB	5.21	7	1.79	Rp257,022,076	Rp256,011,443	Rp1,010,633	Rp565,473
BTB6	5.21	7	1.79	Rp87,755,446	Rp86,671,238	Rp1,084,208	Rp606,640
BKB3	10.43	14	3.57	Rp146,424,005	Rp145,168,638	Rp1,255,367	Rp351,204
BKB4	10.43	14	3.57	Rp146,424,005	Rp145,168,638	Rp1,255,367	Rp351,204
BKB5	10.43	14	3.57	Rp146,424,005	Rp145,168,638	Rp1,255,367	Rp351,204
BKB6	10.43	14	3.57	Rp146,424,005	Rp145,168,638	Rp1,255,367	Rp351,204
BTB	3.72	5	1.28	Rp109,955,666	Rp108,595,596	Rp1,360,070	Rp1,065,388
BP	5.21	7	1.79	Rp90,950,231	Rp89,737,377	Rp1,212,854	Rp678,621
BKB2	10.43	14	3.57	Rp179,468,839	Rp177,929,811	Rp1,539,028	Rp430,561
BKB1	10.43	14	3.57	Rp185,826,970	Rp184,230,627	Rp1,596,343	Rp446,596
BKB	5.21	7	1.79	Rp190,091,782	Rp188,459,131	Rp1,632,651	Rp913,507
BKPB	10.43	14	3.57	Rp408,131,777	Rp405,705,887	Rp2,425,890	Rp678,672

4.3.6 Analisis Biaya Total Proyek

Dalam analisis biaya total proyek terdapat beberapa hal yang harus dilakukan, yaitu menentukan biaya tidak langsung dan biaya langsung proyek. Cara menentukan biaya-biaya tersebut adalah sebagai berikut ini.

1) Biaya Tidak Langsung

Menentukan biaya tidak langsung berdasarkan rumus regresi non linier menggunakan persamaan sebagai berikut ini.

$$= -0.95 - 4,888 (\ln(x_1 - 0,21) - \ln(x_2)) + \varepsilon$$

dengan:

x_1 = nilai total proyek,

x_2 = durasi proyek,

ε = *random error*, dan

y = Prosentase biaya tak langsung.

sehingga biaya tidak langsung dari proyek adalah sebagai berikut :

$$x_1 = \text{Rp.}17.322.738.669,00$$

$$x_2 = 154 \text{ hari}$$

$$\varepsilon = \text{random error}$$

$$y = -0.95 - 4,888 (\ln(x_1 - 0,21) - \ln(x_2)) + \varepsilon$$

$$= -0.95 - 4,888 (\ln(\text{Rp.}17.322.738.669,00 - 0,21)$$

$$\ln(154)) + \varepsilon$$

$$= 9,79\%$$

$$\text{Biaya Tidak Langsung} = y \times x_1$$

$$= 9,79\% \times \text{Rp.}17.322.738.669,00$$

$$= \text{Rp.}1.695.821.424,23$$

Tabel 4.30 Hasil perhitungan biaya tidak langsung untuk lembur 1 jam

Kode	Durasi (hari)			Kumulatif	Biaya Tidak Langsung (Rp)
	Normal	Crash	Selisih		
				154	Rp1,695,821,424.23
PDPL	7	6.20	0.80	153.20	Rp1,687,039,840.33
PT6	7	6.20	0.80	152.41	Rp1,678,258,256.43
BKDPL	7	6.20	0.80	151.61	Rp1,669,476,672.53
BTDPL	5	4.43	0.57	151.04	Rp1,663,204,112.60
BTT6	5	4.43	0.57	150.47	Rp1,656,931,552.67
BKT6	7	6.20	0.80	149.67	Rp1,648,149,968.77
PK4	7	6.20	0.80	148.87	Rp1,639,368,384.87
PK5	7	6.20	0.80	148.08	Rp1,630,586,800.97
PK6	7	6.20	0.80	147.28	Rp1,621,805,217.07
PK3	7	6.20	0.80	146.48	Rp1,613,023,633.17
PK2	7	6.20	0.80	145.68	Rp1,604,242,049.27
PB6	14	12.41	1.59	144.09	Rp1,586,678,881.47
BKK4	7	6.20	0.80	143.29	Rp1,577,897,297.57
BKK5	7	6.20	0.80	142.49	Rp1,569,115,713.67
BKK6	7	6.20	0.80	141.70	Rp1,560,334,129.77
PK1	7	6.20	0.80	140.90	Rp1,551,552,545.87
PP	7	6.20	0.80	140.10	Rp1,542,770,961.97
BKB6	14	12.41	1.59	138.51	Rp1,525,207,794.17
BKB3	14	12.41	1.59	136.91	Rp1,507,644,626.37
BKB4	14	12.41	1.59	135.32	Rp1,490,081,458.57
BKB5	14	12.41	1.59	133.72	Rp1,472,518,290.77
BKK3	7	6.20	0.80	132.92	Rp1,463,736,706.87
BTK4	5	4.43	0.57	132.35	Rp1,457,464,146.94
BTK5	5	4.43	0.57	131.78	Rp1,451,191,587.02
BTK6	5	4.43	0.57	131.22	Rp1,444,919,027.09
BKK2	7	6.20	0.80	130.42	Rp1,436,137,443.19
BKB2	14	12.41	1.59	128.82	Rp1,418,574,275.39
BKB1	14	12.41	1.59	127.23	Rp1,401,011,107.59
BTK3	5	4.43	0.57	126.66	Rp1,394,738,547.66
BKK1	7	6.20	0.80	125.86	Rp1,385,956,963.76
PBB	7	6.20	0.80	125.06	Rp1,377,175,379.86
BTK2	5	4.43	0.57	124.49	Rp1,370,902,819.93
BTB6	7	6.20	0.80	123.70	Rp1,362,121,236.03
BTK1	5	4.43	0.57	123.13	Rp1,355,848,676.10
BKPB	14	12.41	1.59	121.53	Rp1,338,285,508.30
BP	7	6.20	0.80	120.73	Rp1,329,503,924.40
BKB	7	6.20	0.80	119.94	Rp1,320,722,340.50
BTB	5	4.43	0.57	119.37	Rp1,314,449,780.57

Tabel 4.31 Hasil perhitungan biaya tidak langsung untuk lembur 2 jam

Kode	Durasi (hari)				Biaya Tidak Langsung (Rp)
	Normal	Crash	Selisih	Kumulatif	
				154	Rp1,695,821,424.23
PDPL	7	5.63	1.37	152.63	Rp1,680,759,269.47
PT6	7	5.63	1.37	151.26	Rp1,665,697,114.71
BKDPL	7	5.63	1.37	149.90	Rp1,650,634,959.95
BTDPL	5	4.02	0.98	148.92	Rp1,639,876,277.97
BTT6	5	4.02	0.98	147.94	Rp1,629,117,596.00
BKT6	7	5.63	1.37	146.57	Rp1,614,055,441.24
PK4	7	5.63	1.37	145.21	Rp1,598,993,286.48
PK5	7	5.63	1.37	143.84	Rp1,583,931,131.72
PK6	7	5.63	1.37	142.47	Rp1,568,868,976.96
PK3	7	5.63	1.37	141.10	Rp1,553,806,822.20
PK2	7	5.63	1.37	139.74	Rp1,538,744,667.44
PB6	14	11.26	2.74	137.00	Rp1,508,620,357.92
PK1	7	5.63	1.37	135.63	Rp1,493,558,203.16
BKK4	7	5.63	1.37	134.26	Rp1,478,496,048.40
BKK5	7	5.63	1.37	132.90	Rp1,463,433,893.63
BKK6	7	5.63	1.37	131.53	Rp1,448,371,738.87
PP	7	5.63	1.37	130.16	Rp1,433,309,584.11
BKK3	7	5.63	1.37	128.79	Rp1,418,247,429.35
BKB3	14	11.26	2.74	126.06	Rp1,388,123,119.83
BKB4	14	11.26	2.74	123.32	Rp1,357,998,810.31
BKB5	14	11.26	2.74	120.59	Rp1,327,874,500.79
BTK4	5	4.02	0.98	119.61	Rp1,317,115,818.82
BTK6	5	4.02	0.98	118.63	Rp1,306,357,136.85
BKK2	7	5.63	1.37	117.26	Rp1,291,294,982.08
BKB2	14	11.26	2.74	114.53	Rp1,261,170,672.56
BKB1	14	11.26	2.74	111.79	Rp1,231,046,363.04
BTK3	5	4.02	0.98	110.82	Rp1,220,287,681.07
BTK5	5	4.02	0.98	109.84	Rp1,209,528,999.10
BKK1	7	5.63	1.37	108.47	Rp1,194,466,844.34
PBB	7	5.63	1.37	107.10	Rp1,179,404,689.58
BTK2	5	4.02	0.98	106.13	Rp1,168,646,007.60
BTB6	7	5.63	1.37	104.76	Rp1,153,583,852.84
BTK1	5	4.02	0.98	103.78	Rp1,142,825,170.87
BKPB	14	11.26	2.74	101.05	Rp1,112,700,861.35
BP	7	5.63	1.37	99.68	Rp1,097,638,706.59
BKB6	14	11.26	2.74	96.94	Rp1,067,514,397.07
BKB	7	5.63	1.37	95.57	Rp1,052,452,242.31
BTB	5	4.02	0.98	94.60	Rp1,041,693,560.34

Tabel 4.32 Hasil perhitungan biaya tidak langsung untuk lembur 3 jam

Kode	Durasi (hari)			Kumulatif	Biaya Tidak Langsung (Rp)
	Normal	Crash	Selisih		
				154	Rp1,695,821,424.23
PDPL	7	5.21	1.79	152.21	Rp1,676,140,711.37
PT6	7	5.21	1.79	150.43	Rp1,656,459,998.52
BKDPL	7	5.21	1.79	148.64	Rp1,636,779,285.67
BTDPL	5	3.72	1.28	147.36	Rp1,622,721,633.63
BTT6	5	3.72	1.28	146.09	Rp1,608,663,981.59
BKT6	7	5.21	1.79	144.30	Rp1,588,983,268.74
PK4	7	5.21	1.79	142.51	Rp1,569,302,555.88
PK5	7	5.21	1.79	140.72	Rp1,549,621,843.03
PK6	7	5.21	1.79	138.94	Rp1,529,941,130.17
PK3	7	5.21	1.79	137.15	Rp1,510,260,417.32
PK2	7	5.21	1.79	135.36	Rp1,490,579,704.47
PB6	14	10.43	3.57	131.79	Rp1,451,218,278.76
PK1	7	5.21	1.79	130.00	Rp1,431,537,565.91
BKK4	7	5.21	1.79	128.21	Rp1,411,856,853.05
BKK5	7	5.21	1.79	126.43	Rp1,392,176,140.20
BKK6	7	5.21	1.79	124.64	Rp1,372,495,427.35
PP	7	5.21	1.79	122.85	Rp1,352,814,714.49
BKB6	14	10.43	3.57	119.28	Rp1,313,453,288.78
BKB3	14	10.43	3.57	115.70	Rp1,274,091,863.08
BKB4	14	10.43	3.57	112.13	Rp1,234,730,437.37
BKB5	14	10.43	3.57	108.55	Rp1,195,369,011.66
BKK3	7	5.21	1.79	106.77	Rp1,175,688,298.81
BTK4	5	3.72	1.28	105.49	Rp1,161,630,646.77
BTK6	5	3.72	1.28	104.21	Rp1,147,572,994.73
BKK2	7	5.21	1.79	102.43	Rp1,127,892,281.88
BKB2	14	10.43	3.57	98.85	Rp1,088,530,856.17
BKB1	14	10.43	3.57	95.28	Rp1,049,169,430.46
BTK3	5	3.72	1.28	94.00	Rp1,035,111,778.42
BTK5	5	3.72	1.28	92.72	Rp1,021,054,126.39
BKK1	7	5.21	1.79	90.94	Rp1,001,373,413.53
PBB	7	5.21	1.79	89.15	Rp981,692,700.68
BTK2	5	3.72	1.28	87.87	Rp967,635,048.64
BTB6	7	5.21	1.79	86.09	Rp947,954,335.79
BTK1	5	3.72	1.28	84.81	Rp933,896,683.75
BKPB	14	10.43	3.57	81.23	Rp894,535,258.04
BP	7	5.21	1.79	79.45	Rp874,854,545.19
BKB	7	5.21	1.79	77.66	Rp855,173,832.33
BTB	5	3.72	1.28	76.38	Rp841,116,180.30

Berdasarkan hasil analisis diatas, untuk mendapatkan biaya tidak langsung pada setiap waktu percepatan adalah dengan cara sebagai berikut ini.

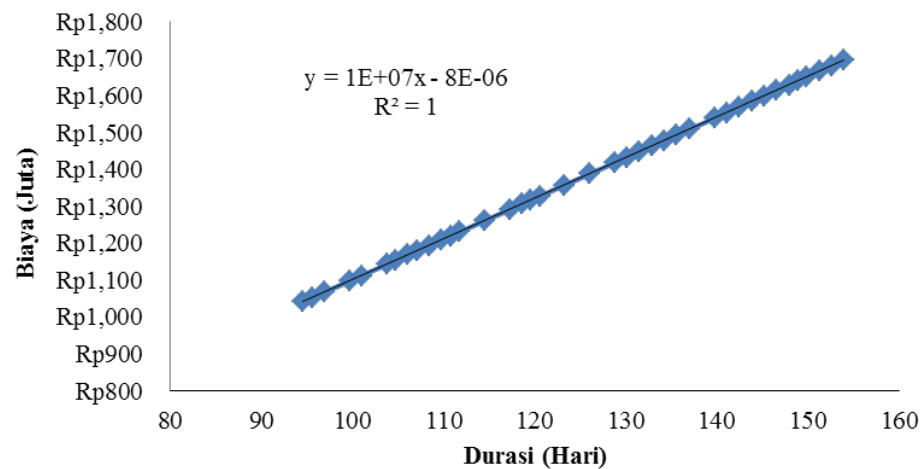
Kegiatan : Pembesian Balok Basement (Kode: PBB)

$$\begin{aligned} \text{Lembur 1 Jam} &= (\text{Rp}1.385.956.963,76 \times 125,06) / 125,86 \\ &= \text{Rp}1.377.175.379,86 \end{aligned}$$

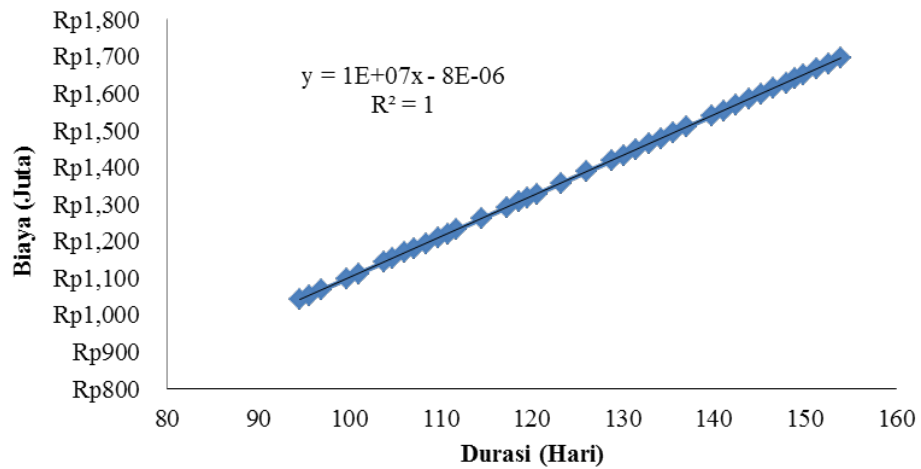
$$\begin{aligned} \text{Lembur 2 Jam} &= (\text{Rp}1.194.466.844,34 \times 107,10) / 108,47 \\ &= \text{Rp}1.179.404.689,58 \end{aligned}$$

$$\begin{aligned} \text{Lembur 3 Jam} &= (\text{Rp}1.001.373.413,53 \times 89,15) / 90,94 \\ &= \text{Rp}981.692.700,68 \end{aligned}$$

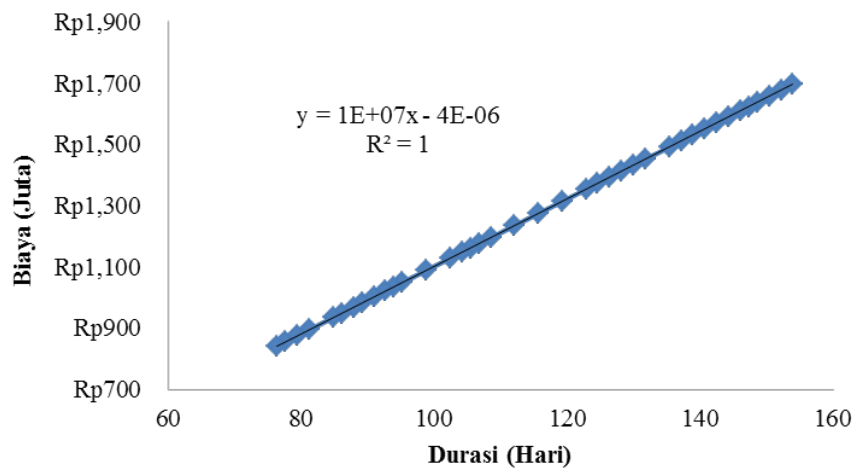
Berdasarkan hasil analisis biaya tidak langsung proyek akibat penambahan jam lembur jika ditampilkan dalam bentuk grafik adalah sebagai berikut ini.



Gambar 4.1 Hubungan antara biaya tidak langsung dan durasi untuk waktu lembur 1 jam



Gambar 4.2 Hubungan antara biaya tidak langsung dan durasi untuk waktu lembur 2 jam



Gambar 4.3 Hubungan antara biaya tidak langsung dan durasi untuk waktu lembur 3 jam

2) Biaya Langsung

Menentukan biaya langsung dapat dilakukan dengan persamaan sebagai berikut ini.

$$\begin{aligned}
 \text{Biaya langsung} &= \text{Biaya Total Proyek} - \text{Biaya Tidak Langsung} \\
 &= \text{Rp.17.322.738.669,00} - \text{Rp.1.695.821.424,23} \\
 &= \text{Rp.15.626.917.244,77}
 \end{aligned}$$

Tabel 4.33 Hasil perhitungan biaya langsung untuk lembur 1 jam

Kode	Durasi (hari)			Kumulatif	Biaya Langsung (Rp)
	Normal	<i>Crash</i>	Selisih		
				154.00	Rp15,626,917,244.77
PDPL	7	6.20	0.80	153.20	Rp15,626,934,087.77
PT6	7	6.20	0.80	152.41	Rp15,626,959,767.77
BKDPL	7	6.20	0.80	151.61	Rp15,627,008,703.77
BTDPL	5	4.43	0.57	151.04	Rp15,627,045,398.77
BTT6	5	4.43	0.57	150.47	Rp15,627,082,093.77
BKT6	7	6.20	0.80	149.67	Rp15,627,137,036.77
PK4	7	6.20	0.80	148.87	Rp15,627,252,396.77
PK5	7	6.20	0.80	148.08	Rp15,627,367,756.77
PK6	7	6.20	0.80	147.28	Rp15,627,484,401.77
PK3	7	6.20	0.80	146.48	Rp15,627,626,595.77
PK2	7	6.20	0.80	145.68	Rp15,627,793,552.77
PB6	14	12.41	1.59	144.09	Rp15,628,172,952.77
BKK4	7	6.20	0.80	143.29	Rp15,628,422,077.77
BKK5	7	6.20	0.80	142.49	Rp15,628,671,202.77
BKK6	7	6.20	0.80	141.70	Rp15,628,920,327.77
PK1	7	6.20	0.80	140.90	Rp15,629,178,326.77
PP	7	6.20	0.80	140.10	Rp15,629,442,183.77
BKB6	14	12.41	1.59	138.51	Rp15,630,002,312.77
BKB3	14	12.41	1.59	136.91	Rp15,630,562,441.77
BKB4	14	12.41	1.59	135.32	Rp15,631,122,570.77
BKB5	14	12.41	1.59	133.72	Rp15,631,682,699.77
BKK3	7	6.20	0.80	132.92	Rp15,631,962,823.77
BTK4	5	4.43	0.57	132.35	Rp15,632,168,595.77
BTK5	5	4.43	0.57	131.78	Rp15,632,374,914.77
BTK6	5	4.43	0.57	131.22	Rp15,632,581,458.77
BKK2	7	6.20	0.80	130.42	Rp15,632,923,305.77
BKB2	14	12.41	1.59	128.82	Rp15,633,610,093.77
BKB1	14	12.41	1.59	127.23	Rp15,634,322,445.77
BTK3	5	4.43	0.57	126.66	Rp15,634,583,769.77
BKK1	7	6.20	0.80	125.86	Rp15,634,994,053.77
PBB	7	6.20	0.80	125.06	Rp15,635,444,181.77
BTK2	5	4.43	0.57	124.49	Rp15,635,776,059.77
BTB6	7	6.20	0.80	123.70	Rp15,636,260,621.77
BTK1	5	4.43	0.57	123.13	Rp15,636,627,350.77
BKPB	14	12.41	1.59	121.53	Rp15,637,709,636.77
BP	7	6.20	0.80	120.73	Rp15,638,316,658.77
BKB	7	6.20	0.80	119.94	Rp15,639,045,096.77
BTB	5	4.43	0.57	119.37	Rp15,639,650,782.77

Tabel 4.34 Hasil perhitungan biaya langsung untuk lembur 2 jam

Kode	Durasi (hari)			Kumulatif	Biaya Langsung (Rp)
	Normal	<i>Crash</i>	Selisih		
				154.00	Rp15,626,917,244.77
PDPL	7	5.63	1.37	152.63	Rp15,626,941,782.77
PT6	7	5.63	1.37	151.26	Rp15,626,985,986.77
BKDPL	7	5.63	1.37	149.90	Rp15,627,070,008.77
BDTDL	5	4.02	0.98	148.92	Rp15,627,133,089.77
BTT6	5	4.02	0.98	147.94	Rp15,627,196,170.77
BKT6	7	5.63	1.37	146.57	Rp15,627,290,357.77
PK4	7	5.63	1.37	145.21	Rp15,627,487,911.77
PK5	7	5.63	1.37	143.84	Rp15,627,685,465.77
PK6	7	5.63	1.37	142.47	Rp15,627,883,019.77
PK3	7	5.63	1.37	141.10	Rp15,628,124,501.77
PK2	7	5.63	1.37	139.74	Rp15,628,409,499.77
PB6	14	11.26	2.74	137.00	Rp15,629,057,598.77
PK1	7	5.63	1.37	135.63	Rp15,629,458,896.77
BKK4	7	5.63	1.37	134.26	Rp15,629,886,395.77
BKK5	7	5.63	1.37	132.90	Rp15,630,313,894.77
BKK6	7	5.63	1.37	131.53	Rp15,630,741,393.77
PP	7	5.63	1.37	130.16	Rp15,631,193,950.77
BKK3	7	5.63	1.37	128.79	Rp15,631,673,662.77
BKB3	14	11.26	2.74	126.06	Rp15,632,635,826.77
BKB4	14	11.26	2.74	123.32	Rp15,633,597,990.77
BKB5	14	11.26	2.74	120.59	Rp15,634,560,154.77
BTK4	5	4.02	0.98	119.61	Rp15,634,915,210.77
BTK6	5	4.02	0.98	118.63	Rp15,635,270,266.77
BKK2	7	5.63	1.37	117.26	Rp15,635,856,788.77
BKB2	14	11.26	2.74	114.53	Rp15,637,036,374.77
BKB1	14	11.26	2.74	111.79	Rp15,638,258,341.77
BTK3	5	4.02	0.98	110.82	Rp15,638,706,869.77
BTK5	5	4.02	0.98	109.84	Rp15,639,206,244.77
BKK1	7	5.63	1.37	108.47	Rp15,639,909,996.77
PBB	7	5.63	1.37	107.10	Rp15,640,682,481.77
BTK2	5	4.02	0.98	106.13	Rp15,641,211,831.77
BTB6	7	5.63	1.37	104.76	Rp15,642,041,703.77
BTK1	5	4.02	0.98	103.78	Rp15,642,668,813.77
BKPB	14	11.26	2.74	101.05	Rp15,644,528,339.77
BP	7	5.63	1.37	99.68	Rp15,645,484,531.77
BKB6	14	11.26	2.74	96.94	Rp15,647,866,691.77
BKB	7	5.63	1.37	95.57	Rp15,649,116,272.77
BTB	5	4.02	0.98	94.60	Rp15,650,046,858.77

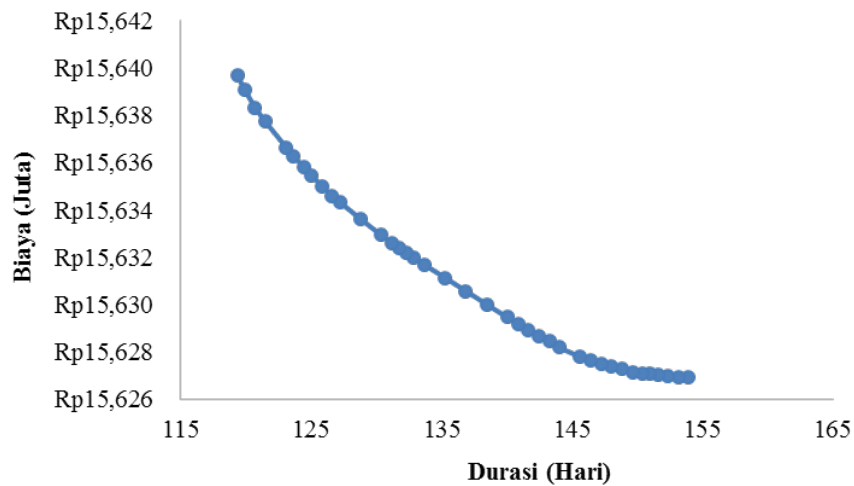
Tabel 4.35 Hasil perhitungan biaya langsung untuk lembur 3 jam

Kode	Durasi (hari)			Kumulatif	Biaya Langsung (Rp)
	Normal	<i>Crash</i>	Selisih		
				154.00	Rp15,626,917,244.77
PDPL	7	5.21	1.79	152.21	Rp15,626,947,558.77
PT6	7	5.21	1.79	150.43	Rp15,627,005,017.77
BKDPL	7	5.21	1.79	148.64	Rp15,627,114,825.77
BTDPL	5	3.72	1.28	147.36	Rp15,627,197,219.77
BTT6	5	3.72	1.28	146.09	Rp15,627,279,613.77
BKT6	7	5.21	1.79	144.30	Rp15,627,494,421.77
PK4	7	5.21	1.79	142.51	Rp15,627,752,568.77
PK5	7	5.21	1.79	140.72	Rp15,628,010,715.77
PK6	7	5.21	1.79	138.94	Rp15,628,268,862.77
PK3	7	5.21	1.79	137.15	Rp15,628,583,033.77
PK2	7	5.21	1.79	135.36	Rp15,628,954,565.77
PB6	14	10.43	3.57	131.79	Rp15,629,800,135.77
PK1	7	5.21	1.79	130.00	Rp15,630,306,420.77
BKK4	7	5.21	1.79	128.21	Rp15,630,864,785.77
BKK5	7	5.21	1.79	126.43	Rp15,631,423,150.77
BKK6	7	5.21	1.79	124.64	Rp15,631,981,515.77
PP	7	5.21	1.79	122.85	Rp15,632,573,467.77
BKB6	14	10.43	3.57	119.28	Rp15,633,828,834.77
BKB3	14	10.43	3.57	115.70	Rp15,635,084,201.77
BKB4	14	10.43	3.57	112.13	Rp15,636,339,568.77
BKB5	14	10.43	3.57	108.55	Rp15,637,594,935.77
BKK3	7	5.21	1.79	106.77	Rp15,638,220,772.77
BTK4	5	3.72	1.28	105.49	Rp15,638,682,809.77
BTK6	5	3.72	1.28	104.21	Rp15,639,146,576.77
BKK2	7	5.21	1.79	102.43	Rp15,639,913,870.77
BKB2	14	10.43	3.57	98.85	Rp15,641,452,898.77
BKB1	14	10.43	3.57	95.28	Rp15,643,049,241.77
BTK3	5	3.72	1.28	94.00	Rp15,643,636,085.77
BTK5	5	3.72	1.28	92.72	Rp15,644,233,381.77
BKK1	7	5.21	1.79	90.94	Rp15,645,152,851.77
PBB	7	5.21	1.79	89.15	Rp15,646,163,484.77
BTK2	5	3.72	1.28	87.87	Rp15,646,853,814.77
BTB6	7	5.21	1.79	86.09	Rp15,647,938,022.77
BTK1	5	3.72	1.28	84.81	Rp15,648,757,098.77
BKPB	14	10.43	3.57	81.23	Rp15,651,182,988.77
BP	7	5.21	1.79	79.45	Rp15,652,395,842.77
BKB	7	5.21	1.79	77.66	Rp15,654,028,493.77
BTB	5	3.72	1.28	76.38	Rp15,655,388,563.77

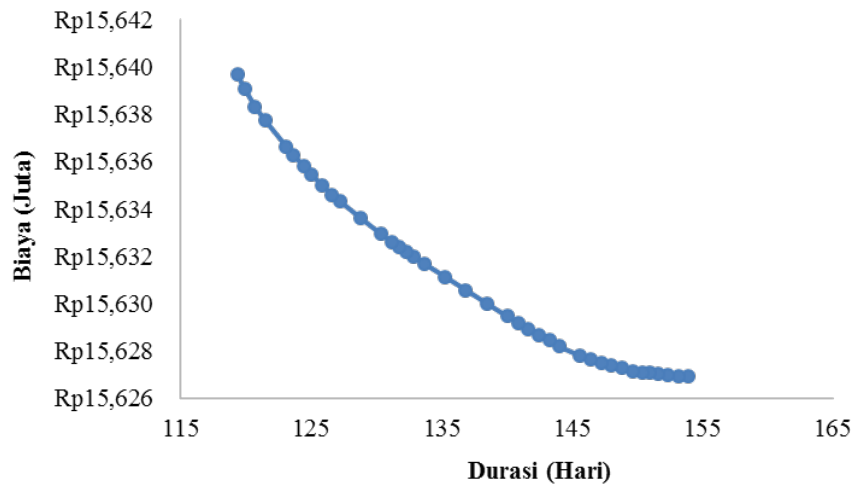
Berdasarkan dari hasil analisis diatas, untuk mendapatkan biaya langsung pada setiap waktu percepatan adalah dengan cara sebagai berikut ini:

$$\begin{aligned}
 \text{Kegiatan} &= \text{Pembesian Balok } \textit{Basement} \text{ (Kode: PBB)} \\
 \text{Lembur 1 jam} &= \text{Biaya langsung} + \text{selisih biaya} \\
 &= \text{Rp}15.634.994.053,77 + \text{Rp}450.128,00 \\
 &= \text{Rp}15.635.444.181,77 \\
 \text{Lembur 2 jam} &= \text{Biaya langsung} + \text{selisih biaya} \\
 &= \text{Rp}15.639.909.996,77 + \text{Rp}772.485,00 \\
 &= \text{Rp}15.640.682.481,77 \\
 \text{Lembur 3 jam} &= \text{Biaya langsung} + \text{selisih biaya} \\
 &= \text{Rp}15.645.152.851,77 + \text{Rp}1.010.633,00 \\
 &= \text{Rp}15.646.163.484,77
 \end{aligned}$$

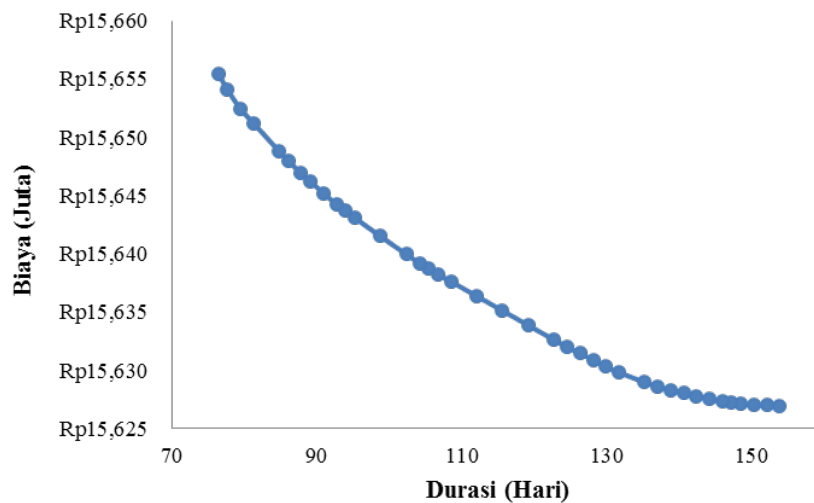
Berdasarkan hasil analisis biaya langsung proyek akibat penambahan jam lembur jika ditampilkan dalam bentuk grafik adalah sebagai berikut ini.



Gambar 4.4 Hubungan antara biaya langsung dan durasi untuk waktu lembur 1 jam



Gambar 4.5 Hubungan antara biaya langsung dan durasi untuk waktu lembur 2 jam



Gambar 4.6 Hubungan antara biaya langsung dan durasi untuk waktu lembur 3 jam

3) Total Biaya

Total biaya merupakan penjumlahan dari biaya tidak langsung dan biaya langsung suatu proyek akibat penambahan jam lembur 1 jam, 2 jam dan 3 jam. Menentukan biaya total dapat dilakukan dengan persamaan sebagai berikut ini.

Total biaya = biaya tidak langsung + biaya langsung

Sehingga nilai dari total biaya pada kegiatan proyek sebagai berikut ini.

Kegiatan : Pembesian Balok *Basement*

Lembur 1 jam = Rp1.377.175.379,86 + Rp15.634.668.081,77
= Rp17.011.843.461,63

Lembur 2 jam = Rp1.179.404.689,58 + Rp15.639.305.096,77
= Rp16.818.709.786,35

Lembur 3 jam = Rp981.692.700,68 + Rp15.644.366.360,77
= Rp16.626.059.061,45

Tabel 4.36 Hasil perhitungan total biaya untuk lembur 1 jam

Kode	Biaya Tidak Langsung (Rp)	Biaya Langsung (Rp)	Total Biaya (Rp)
	Rp1,695,821,424.23	Rp15,626,917,244.77	Rp17,322,738,669.00
PDPL	Rp1,687,039,840.33	Rp15,626,934,087.77	Rp17,313,973,928.10
PT6	Rp1,678,258,256.43	Rp15,626,959,767.77	Rp17,305,218,024.20
BKDPL	Rp1,669,476,672.53	Rp15,626,996,462.77	Rp17,296,473,135.30
BTDPL	Rp1,663,204,112.60	Rp15,627,033,157.77	Rp17,290,237,270.37
BTT6	Rp1,656,931,552.67	Rp15,627,082,093.77	Rp17,284,013,646.44
BKT6	Rp1,648,149,968.77	Rp15,627,137,036.77	Rp17,275,287,005.54
PK4	Rp1,639,368,384.87	Rp15,627,252,396.77	Rp17,266,620,781.64
PK5	Rp1,630,586,800.97	Rp15,627,367,756.77	Rp17,257,954,557.74
PK6	Rp1,621,805,217.07	Rp15,627,484,401.77	Rp17,249,289,618.84
PK3	Rp1,613,023,633.17	Rp15,627,626,595.77	Rp17,240,650,228.94
PK2	Rp1,604,242,049.27	Rp15,627,793,552.77	Rp17,232,035,602.04
PB6	Rp1,586,678,881.47	Rp15,627,999,324.77	Rp17,214,678,206.24
BKK4	Rp1,577,897,297.57	Rp15,628,205,643.77	Rp17,206,102,941.34
BKK5	Rp1,569,115,713.67	Rp15,628,412,187.77	Rp17,197,527,901.44
BKK6	Rp1,560,334,129.77	Rp15,628,661,312.77	Rp17,188,995,442.54
PK1	Rp1,551,552,545.87	Rp15,628,910,437.77	Rp17,180,462,983.64
PP	Rp1,542,770,961.97	Rp15,629,159,562.77	Rp17,171,930,524.74
BKB6	Rp1,525,207,794.17	Rp15,629,417,561.77	Rp17,154,625,355.94
BKB3	Rp1,507,644,626.37	Rp15,629,678,885.77	Rp17,137,323,512.14
BKB4	Rp1,490,081,458.57	Rp15,629,942,742.77	Rp17,120,024,201.34
BKB5	Rp1,472,518,290.77	Rp15,630,222,866.77	Rp17,102,741,157.55
BKK3	Rp1,463,736,706.87	Rp15,630,554,744.77	Rp17,094,291,451.65
BTK4	Rp1,457,464,146.94	Rp15,630,896,591.77	Rp17,088,360,738.72
BTK5	Rp1,451,191,587.02	Rp15,631,263,320.77	Rp17,082,454,907.79
BTK6	Rp1,444,919,027.09	Rp15,631,642,720.77	Rp17,076,561,747.86
BKK2	Rp1,436,137,443.19	Rp15,632,053,004.77	Rp17,068,190,447.96
BKB2	Rp1,418,574,275.39	Rp15,632,503,132.77	Rp17,051,077,408.16
BKB1	Rp1,401,011,107.59	Rp15,632,987,694.77	Rp17,033,998,802.36
BTK3	Rp1,394,738,547.66	Rp15,633,547,823.77	Rp17,028,286,371.43
BKK1	Rp1,385,956,963.76	Rp15,634,107,952.77	Rp17,020,064,916.53
PBB	Rp1,377,175,379.86	Rp15,634,668,081.77	Rp17,011,843,461.63
BTK2	Rp1,370,902,819.93	Rp15,635,228,210.77	Rp17,006,131,030.70
BTB6	Rp1,362,121,236.03	Rp15,635,833,896.77	Rp16,997,955,132.80
BTK1	Rp1,355,848,676.10	Rp15,636,440,918.77	Rp16,992,289,594.87
BKPB	Rp1,338,285,508.30	Rp15,637,127,706.77	Rp16,975,413,215.08
BP	Rp1,329,503,924.40	Rp15,637,840,058.77	Rp16,967,343,983.18
BKB	Rp1,320,722,340.50	Rp15,638,568,496.77	Rp16,959,290,837.28
BTB	Rp1,314,449,780.57	Rp15,639,650,782.77	Rp16,954,100,563.35

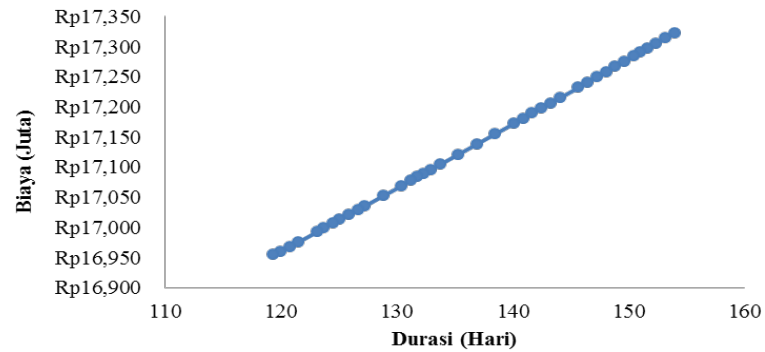
Tabel 4.37 Hasil perhitungan total biaya untuk lembur 2 jam

Kode	Biaya Tidak Langsung (Rp)	Biaya Langsung (Rp)	Total Biaya (Rp)
	Rp1,695,821,424.23	Rp15,626,917,244.77	Rp17,322,738,669.00
PDPL	Rp1,680,759,269.47	Rp15,626,941,782.77	Rp17,307,701,052.24
PT6	Rp1,665,697,114.71	Rp15,626,985,986.77	Rp17,292,683,101.48
BKDPL	Rp1,650,634,959.95	Rp15,627,049,067.77	Rp17,277,684,027.72
BTDPL	Rp1,639,876,277.97	Rp15,627,112,148.77	Rp17,266,988,426.75
BTT6	Rp1,629,117,596.00	Rp15,627,196,170.77	Rp17,256,313,766.77
BKT6	Rp1,614,055,441.24	Rp15,627,290,357.77	Rp17,241,345,799.01
PK4	Rp1,598,993,286.48	Rp15,627,487,911.77	Rp17,226,481,198.25
PK5	Rp1,583,931,131.72	Rp15,627,685,465.77	Rp17,211,616,597.49
PK6	Rp1,568,868,976.96	Rp15,627,883,019.77	Rp17,196,751,996.73
PK3	Rp1,553,806,822.20	Rp15,628,124,501.77	Rp17,181,931,323.97
PK2	Rp1,538,744,667.44	Rp15,628,409,499.77	Rp17,167,154,167.21
PB6	Rp1,508,620,357.92	Rp15,628,764,555.77	Rp17,137,384,913.69
PK1	Rp1,493,558,203.16	Rp15,629,263,930.77	Rp17,122,822,133.93
BKK4	Rp1,478,496,048.40	Rp15,629,618,986.77	Rp17,108,115,035.17
BKK5	Rp1,463,433,893.63	Rp15,630,046,485.77	Rp17,093,480,379.41
BKK6	Rp1,448,371,738.87	Rp15,630,473,984.77	Rp17,078,845,723.65
PP	Rp1,433,309,584.11	Rp15,630,901,483.77	Rp17,064,211,067.89
BKK3	Rp1,418,247,429.35	Rp15,631,302,781.77	Rp17,049,550,211.13
BKB3	Rp1,388,123,119.83	Rp15,631,751,309.77	Rp17,019,874,429.60
BKB4	Rp1,357,998,810.31	Rp15,632,203,866.77	Rp16,990,202,677.08
BKB5	Rp1,327,874,500.79	Rp15,632,683,578.77	Rp16,960,558,079.56
BTK4	Rp1,317,115,818.82	Rp15,633,212,928.77	Rp16,950,328,747.59
BTK6	Rp1,306,357,136.85	Rp15,633,799,450.77	Rp16,940,156,587.62
BKK2	Rp1,291,294,982.08	Rp15,634,426,560.77	Rp16,925,721,542.86
BKB2	Rp1,261,170,672.56	Rp15,635,074,659.77	Rp16,896,245,332.34
BKB1	Rp1,231,046,363.04	Rp15,635,778,411.77	Rp16,866,824,774.81
BTK3	Rp1,220,287,681.07	Rp15,636,550,896.77	Rp16,856,838,577.84
BTK5	Rp1,209,528,999.10	Rp15,637,380,768.77	Rp16,846,909,767.87
BKK1	Rp1,194,466,844.34	Rp15,638,342,932.77	Rp16,832,809,777.11
PBB	Rp1,179,404,689.58	Rp15,639,305,096.77	Rp16,818,709,786.35
BTK2	Rp1,168,646,007.60	Rp15,640,267,260.77	Rp16,808,913,268.38
BTB6	Rp1,153,583,852.84	Rp15,642,649,420.77	Rp16,796,233,273.62
BTK1	Rp1,142,825,170.87	Rp15,643,580,006.77	Rp16,786,405,177.65
BKPB	Rp1,112,700,861.35	Rp15,644,536,198.77	Rp16,757,237,060.12
BP	Rp1,097,638,706.59	Rp15,645,715,784.77	Rp16,743,354,491.36
BKB6	Rp1,067,514,397.07	Rp15,646,937,751.77	Rp16,714,452,148.84
BKB	Rp1,052,452,242.31	Rp15,648,187,332.77	Rp16,700,639,575.08
BTB	Rp1,041,693,560.34	Rp15,650,046,858.77	Rp16,691,740,419.11

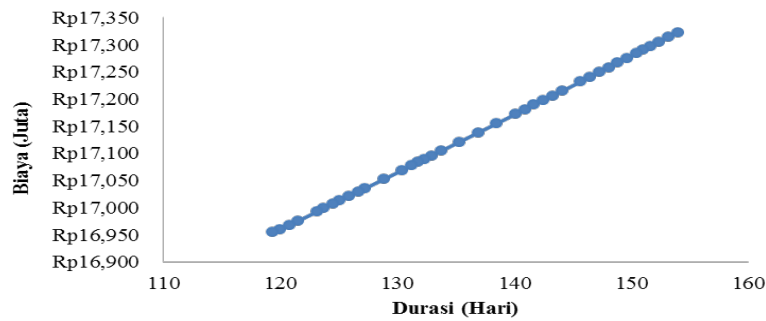
Tabel 4.38 Hasil perhitungan total biaya untuk lembur 3 jam

Kode	Biaya Tidak Langsung (Rp)	Biaya Langsung (Rp)	Total Biaya (Rp)
	Rp1,695,821,424.23	Rp15,626,917,244.77	Rp17,322,738,669.00
PDPL	Rp1,676,140,711.37	Rp15,626,947,558.77	Rp17,303,088,270.15
PT6	Rp1,656,459,998.52	Rp15,627,005,017.77	Rp17,283,465,016.29
BKDPL	Rp1,636,779,285.67	Rp15,627,087,411.77	Rp17,263,866,697.44
BTDP	Rp1,622,721,633.63	Rp15,627,169,805.77	Rp17,249,891,439.40
BTT6	Rp1,608,663,981.59	Rp15,627,279,613.77	Rp17,235,943,595.36
BKT6	Rp1,588,983,268.74	Rp15,627,494,421.77	Rp17,216,477,690.51
PK4	Rp1,569,302,555.88	Rp15,627,752,568.77	Rp17,197,055,124.65
PK5	Rp1,549,621,843.03	Rp15,628,010,715.77	Rp17,177,632,558.80
PK6	Rp1,529,941,130.17	Rp15,628,268,862.77	Rp17,158,209,992.95
PK3	Rp1,510,260,417.32	Rp15,628,583,033.77	Rp17,138,843,451.09
PK2	Rp1,490,579,704.47	Rp15,628,954,565.77	Rp17,119,534,270.24
PB6	Rp1,451,218,278.76	Rp15,629,416,602.77	Rp17,080,634,881.53
PK1	Rp1,431,537,565.91	Rp15,630,013,898.77	Rp17,061,551,464.68
BKK4	Rp1,411,856,853.05	Rp15,630,477,665.77	Rp17,042,334,518.83
BKK5	Rp1,392,176,140.20	Rp15,631,036,030.77	Rp17,023,212,170.97
BKK6	Rp1,372,495,427.35	Rp15,631,594,395.77	Rp17,004,089,823.12
PP	Rp1,352,814,714.49	Rp15,632,152,760.77	Rp16,984,967,475.26
BKB6	Rp1,313,453,288.78	Rp15,632,659,045.77	Rp16,946,112,334.56
BKB3	Rp1,274,091,863.08	Rp15,633,245,889.77	Rp16,907,337,752.85
BKB4	Rp1,234,730,437.37	Rp15,633,837,841.77	Rp16,868,568,279.14
BKB5	Rp1,195,369,011.66	Rp15,634,463,678.77	Rp16,829,832,690.43
BKK3	Rp1,175,688,298.81	Rp15,635,154,008.77	Rp16,810,842,307.58
BTK4	Rp1,161,630,646.77	Rp15,635,921,302.77	Rp16,797,551,949.54
BTK6	Rp1,147,572,994.73	Rp15,636,740,378.77	Rp16,784,313,373.50
BKK2	Rp1,127,892,281.88	Rp15,637,585,948.77	Rp16,765,478,230.65
BKB2	Rp1,088,530,856.17	Rp15,638,505,418.77	Rp16,727,036,274.94
BKB1	Rp1,049,169,430.46	Rp15,639,516,051.77	Rp16,688,685,482.24
BTK3	Rp1,035,111,778.42	Rp15,640,600,259.77	Rp16,675,712,038.20
BTK5	Rp1,021,054,126.39	Rp15,641,855,626.77	Rp16,662,909,753.16
BKK1	Rp1,001,373,413.53	Rp15,643,110,993.77	Rp16,644,484,407.31
PBB	Rp981,692,700.68	Rp15,644,366,360.77	Rp16,626,059,061.45
BTK2	Rp967,635,048.64	Rp15,645,621,727.77	Rp16,613,256,776.41
BTB6	Rp947,954,335.79	Rp15,646,981,797.77	Rp16,594,936,133.56
BTK1	Rp933,896,683.75	Rp15,648,194,651.77	Rp16,582,091,335.52
BKPB	Rp894,535,258.04	Rp15,649,733,679.77	Rp16,544,268,937.81
BP	Rp874,854,545.19	Rp15,651,330,022.77	Rp16,526,184,567.96
BKB	Rp855,173,832.33	Rp15,652,962,673.77	Rp16,508,136,506.11
BTB	Rp841,116,180.30	Rp15,655,388,563.77	Rp16,496,504,744.07

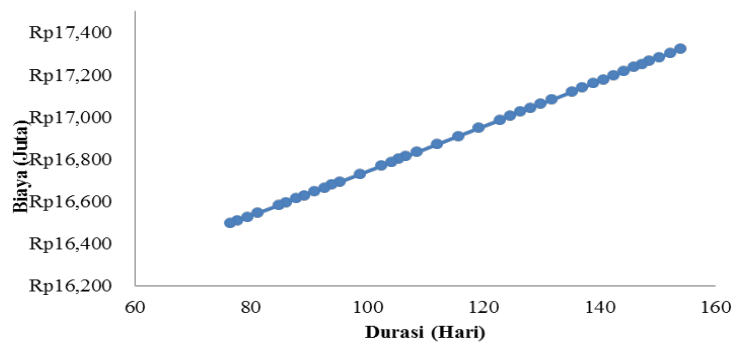
Berdasarkan hasil analisis total biaya proyek akibat penambahan jam lembur jika ditampilkan dalam bentuk grafik adalah sebagai berikut ini.



Gambar 4.7 Hubungan antara total biaya dan durasi untuk waktu lembur 1 jam



Gambar 4.8 Hubungan antara total biaya dan durasi untuk waktu lembur 2 jam



Gambar 4.9 Hubungan antara total biaya dan durasi untuk waktu lembur 3 jam

Hasil grafik biaya total yang didapat pada penelitian ini berbeda dengan hasil teori grafik hubungan waktu dengan biaya langsung, biaya tidak langsung dan biaya total. Total biaya proyek akibat penambahan jam lembur pada grafik ini seharusnya menunjukkan hubungan (titik optimum) antara biaya langsung, biaya tak langsung dan total biaya, dimana seharusnya terlihat bahwa biaya optimal didapat dengan mencari biaya proyek terkecil. Akan tetapi pada penelitian ini tidak didapat hasil yang seharusnya bisa dijadikan acuan untuk mendapatkan titik optimum sehingga biaya optimum dapat langsung ditentukan dari grafik hubungan waktu dengan biaya langsung, biaya tidak langsung dan biaya total.

4.3.7 Efisiensi waktu dan biaya proyek

Dalam menentukan efisiensi waktu dan biaya proyek karena dilakukannya penambahan jam lembur untuk percepatan durasi proyek dapat menggunakan perhitungan sebagai berikut.

Kegiatan : Pembesian Balok *Basement*

1. Lembur 1 jam

Efisiensi waktu

$$E_t = \left(\frac{154 - 125,06}{154} \right) \times 100\% = 18,79\%$$

Efisiensi biaya

$$E_c = \left(\frac{\text{Rp}17.322.738.669,00 - \text{Rp}17.011.843.461,63}{\text{Rp}17.322.738.669,00} \right) \times 100\%$$

$$E_c = 1,79\%$$

2. Lembur 2 jam

Efisiensi waktu

$$E_t = \left(\frac{154 - 107,10}{154} \right) \times 100\% = 30,45\%$$

Efisiensi biaya

$$E_c = \left(\frac{Rp17.322.738.669,00 - Rp16.818.709.786,35}{Rp17.322.738.669,00} \right) \times 100\%$$

$$E_c = 2,91\%$$

3. Lembur 3 jam

Efisiensi waktu

$$E_t = \left(\frac{154 - 89,15}{154} \right) \times 100\% = 42,11\%$$

Efisiensi biaya

$$E_c = \left(\frac{Rp17.322.738.669,00 - Rp16.626.059.061,45}{Rp17.322.738.669,00} \right) \times 100\%$$

$$E_c = 4,02\%$$

Tabel 4.39 Hasil perhitungan efisiensi waktu dan biaya untuk lembur 1 jam

Kode	Durasi Kumulatif (Hari)	Biaya Total (Rp)	Efisiensi Waktu (%)	Efisiensi Biaya (%)
	154	Rp17,322,738,669.00		
PDPL	153.20	Rp17,313,973,928.10	0.52	0.05
PT6	152.41	Rp17,305,218,024.20	1.04	0.10
BKDPL	151.61	Rp17,296,473,135.30	1.55	0.15
BTDPL	151.04	Rp17,290,237,270.37	1.92	0.19
BTT6	150.47	Rp17,284,013,646.44	2.29	0.22
BKT6	149.67	Rp17,275,287,005.54	2.81	0.27
PK4	148.87	Rp17,266,620,781.64	3.33	0.32
PK5	148.08	Rp17,257,954,557.74	3.85	0.37
PK6	147.28	Rp17,249,289,618.84	4.36	0.42
PK3	146.48	Rp17,240,650,228.94	4.88	0.47
PK2	145.68	Rp17,232,035,602.04	5.40	0.52
PB6	144.09	Rp17,214,678,206.24	6.44	0.62
BKK4	143.29	Rp17,206,102,941.34	6.95	0.67
BKK5	142.49	Rp17,197,527,901.44	7.47	0.72
BKK6	141.70	Rp17,188,995,442.54	7.99	0.77
PK1	140.90	Rp17,180,462,983.64	8.51	0.82
PP	140.10	Rp17,171,930,524.74	9.03	0.87
BKB6	138.51	Rp17,154,625,355.94	10.06	0.97
BKB3	136.91	Rp17,137,323,512.14	11.10	1.07
BKB4	135.32	Rp17,120,024,201.34	12.13	1.17

Lanjutan tabel 3.39 Hasil perhitungan efisiensi waktu dan biaya untuk lembur 1 jam

Kode	Durasi Kumulatif (Hari)	Biaya Total (Rp)	Efisiensi Waktu (%)	Efisiensi Biaya (%)
BKB5	133.72	Rp17,102,741,157.55	13.17	1.27
BKK3	132.92	Rp17,094,291,451.65	13.69	1.32
BTK4	132.35	Rp17,088,360,738.72	14.06	1.35
BTK5	131.78	Rp17,082,454,907.79	14.43	1.39
BTK6	131.22	Rp17,076,561,747.86	14.80	1.42
BKK2	130.42	Rp17,068,190,447.96	15.31	1.47
BKB2	128.82	Rp17,051,077,408.16	16.35	1.57
BKB1	127.23	Rp17,033,998,802.36	17.38	1.67
BTK3	126.66	Rp17,028,286,371.43	17.75	1.70
BKK1	125.86	Rp17,020,064,916.53	18.27	1.75
PBB	125.06	Rp17,011,843,461.63	18.79	1.79
BTK2	124.49	Rp17,006,131,030.70	19.16	1.83
BTB6	123.70	Rp16,997,955,132.80	19.68	1.87
BTK1	123.13	Rp16,992,289,594.87	20.05	1.91
BKPB	121.53	Rp16,975,413,215.08	21.08	2.01
BP	120.73	Rp16,967,343,983.18	21.60	2.05
BKB	119.94	Rp16,959,290,837.28	22.12	2.10
BTB	119.37	Rp16,954,100,563.35	22.49	2.13

Tabel 4.40 Hasil perhitungan efisiensi waktu dan biaya untuk lembur 2 jam

Kode	Durasi Kumulatif (Hari)	Biaya Total (Rp)	Efisiensi Waktu (%)	Efisiensi Biaya (%)
	154	Rp17,322,738,669.00		
PDPL	152.63	Rp17,307,701,052.24	0.89	0.09
PT6	151.26	Rp17,292,683,101.48	1.78	0.17
BKDPL	149.90	Rp17,277,684,027.72	2.66	0.26
BDTDL	148.92	Rp17,266,988,426.75	3.30	0.32
BTT6	147.94	Rp17,256,313,766.77	3.93	0.38
BKT6	146.57	Rp17,241,345,799.01	4.82	0.47
PK4	145.21	Rp17,226,481,198.25	5.71	0.56
PK5	143.84	Rp17,211,616,597.49	6.60	0.64
PK6	142.47	Rp17,196,751,996.73	7.49	0.73
PK3	141.10	Rp17,181,931,323.97	8.37	0.81
PK2	139.74	Rp17,167,154,167.21	9.26	0.90
PB6	137.00	Rp17,137,384,913.69	11.04	1.07
PK1	135.63	Rp17,122,822,133.93	11.93	1.15
BKK4	134.26	Rp17,108,115,035.17	12.82	1.24
BKK5	132.90	Rp17,093,480,379.41	13.70	1.32

Lanjutan tabel 4.40 Hasil perhitungan efisiensi waktu dan biaya untuk lembur 2 jam

Kode	Durasi Kumulatif (Hari)	Biaya Total (Rp)	Efisiensi Waktu (%)	Efisiensi Biaya (%)
BKK6	131.53	Rp17,078,845,723.65	14.59	1.41
PP	130.16	Rp17,064,211,067.89	15.48	1.49
BKK3	128.79	Rp17,049,550,211.13	16.37	1.58
BKB3	126.06	Rp17,019,874,429.60	18.14	1.75
BKB4	123.32	Rp16,990,202,677.08	19.92	1.92
BKB5	120.59	Rp16,960,558,079.56	21.70	2.09
BTK4	119.61	Rp16,950,328,747.59	22.33	2.15
BTK6	118.63	Rp16,940,156,587.62	22.97	2.21
BKK2	117.26	Rp16,925,721,542.86	23.85	2.29
BKB2	114.53	Rp16,896,245,332.34	25.63	2.46
BKB1	111.79	Rp16,866,824,774.81	27.41	2.63
BTK3	110.82	Rp16,856,838,577.84	28.04	2.69
BTK5	109.84	Rp16,846,909,767.87	28.68	2.75
BKK1	108.47	Rp16,832,809,777.11	29.56	2.83
PBB	107.10	Rp16,818,709,786.35	30.45	2.91
BTK2	106.13	Rp16,808,913,268.38	31.09	2.97
BTB6	104.76	Rp16,796,233,273.62	31.97	3.04
BTK1	103.78	Rp16,786,405,177.65	32.61	3.10
BKPB	101.05	Rp16,757,237,060.12	34.39	3.26
BP	99.68	Rp16,743,354,491.36	35.27	3.34
BKB6	96.94	Rp16,714,452,148.84	37.05	3.51
BKB	95.57	Rp16,700,639,575.08	37.94	3.59
BTB	94.60	Rp16,691,740,419.11	38.57	3.64

Tabel 4.41 Hasil perhitungan efisiensi waktu dan biaya untuk lembur 3 jam

Kode	Durasi Kumulatif (Hari)	Biaya Total (Rp)	Efisiensi Waktu (%)	Efisiensi Biaya (%)
	154	Rp17,322,738,669.00		
PDPL	152.21	Rp17,303,088,270.15	1.16	0.11
PT6	150.43	Rp17,283,465,016.29	2.32	0.23
BKDPL	148.64	Rp17,263,866,697.44	3.48	0.34
BTDPL	147.36	Rp17,249,891,439.40	4.31	0.42
BTT6	146.09	Rp17,235,943,595.36	5.14	0.50
BKT6	144.30	Rp17,216,477,690.51	6.30	0.61
PK4	142.51	Rp17,197,055,124.65	7.46	0.73
PK5	140.72	Rp17,177,632,558.80	8.62	0.84
PK6	138.94	Rp17,158,209,992.95	9.78	0.95

Lanjutan Tabel 4.41 Hasil perhitungan efisiensi waktu dan biaya untuk lembur 3 jam

Kode	Durasi Kumulatif (Hari)	Biaya Total (Rp)	Efisiensi Waktu (%)	Efisiensi Biaya (%)
PK3	137.15	Rp17,138,843,451.09	10.94	1.06
PK2	135.36	Rp17,119,534,270.24	12.10	1.17
PB6	131.79	Rp17,080,634,881.53	14.42	1.40
PK1	130.00	Rp17,061,551,464.68	15.58	1.51
BKK4	128.21	Rp17,042,334,518.83	16.74	1.62
BKK5	126.43	Rp17,023,212,170.97	17.91	1.73
BKK6	124.64	Rp17,004,089,823.12	19.07	1.84
PP	122.85	Rp16,984,967,475.26	20.23	1.95
BKB6	119.28	Rp16,946,112,334.56	22.55	2.17
BKB3	115.70	Rp16,907,337,752.85	24.87	2.40
BKB4	112.13	Rp16,868,568,279.14	27.19	2.62
BKB5	108.55	Rp16,829,832,690.43	29.51	2.85
BKK3	106.77	Rp16,810,842,307.58	30.67	2.96
BTK4	105.49	Rp16,797,551,949.54	31.50	3.03
BTK6	104.21	Rp16,784,313,373.50	32.33	3.11
BKK2	102.43	Rp16,765,478,230.65	33.49	3.22
BKB2	98.85	Rp16,727,036,274.94	35.81	3.44
BKB1	95.28	Rp16,688,685,482.24	38.13	3.66
BTK3	94.00	Rp16,675,712,038.20	38.96	3.74
BTK5	92.72	Rp16,662,909,753.16	39.79	3.81
BKK1	90.94	Rp16,644,484,407.31	40.95	3.92
PBB	89.15	Rp16,626,059,061.45	42.11	4.02
BTK2	87.87	Rp16,613,256,776.41	42.94	4.10
BTB6	86.09	Rp16,594,936,133.56	44.10	4.20
BTK1	84.81	Rp16,582,091,335.52	44.93	4.28
BKPB	81.23	Rp16,544,268,937.81	47.25	4.49
BP	79.45	Rp16,526,184,567.96	48.41	4.60
BKB	77.66	Rp16,508,136,506.11	49.57	4.70
BTB	76.38	Rp16,496,504,744.07	50.40	4.77

4.3.8 Analisa Biaya Penambahan Tenaga Kerja

Penambahan tenaga merupakan kebutuhan tenaga kerja yang dihitung kembali berdasarkan pada durasi kegiatan yang telah dilakukan percepatan tanpa mengurangi maupun menambahkan jam kerja yang telah ada.

Nama pekerjaan : Pemebsian balok *basement* (PBB)

Volume pekerjaan = 25653,30 kg

Durasi normal = 7 hari

Durasi percepatan = 6,20 hari

Tabel 4.42 Kebutuhan tenaga kerja kegiatan pembesian balok *basement*

Tenaga Kerja	Satuan	Koefisien	Harga
Pekerja	OH	0.007	Rp7.142,86
Tukang Besi	OH	0.007	Rp12.857,14
Kepala Tukang	OH	0.0007	Rp12.857,14
Mandor	OH	0.0004	Rp12.857,14

- Pekerja

$$\text{Jumlah tenaga kerja} = \left(\frac{0,007 \times 25653,3}{6,2 \times 7} \right)$$

$$= 4,14$$

$$\text{Upah tenaga kerja} = \text{Jumlah tenaga kerja} \times \text{Harga}$$

$$= 4,14 \times \text{Rp}7.142,86$$

$$= \text{Rp}29.571,43$$

- Mandor

$$\text{Jumlah tenaga kerja} = \left(\frac{0,0004 \times 25653,3}{6,20 \times 7} \right)$$

$$= 4,14$$

$$\text{Upah tenaga kerja} = \text{Jumlah tenaga kerja} \times \text{Harga}$$

$$= 4,14 \times \text{Rp}12.857,14$$

$$= \text{Rp}53.228,57$$

- Kepala tukang

$$\text{Jumlah tenaga kerja} = \left(\frac{0,0007 \times 25653,3}{6,20 \times 7} \right)$$

$$= 0,42$$

$$\text{Upah tenaga kerja} = \text{Jumlah tenaga kerja} \times \text{Harga}$$

$$= 0,42 \times \text{Rp}12.857,14$$

$$\begin{aligned}
 &= \text{Rp}5.400,00 \\
 - \quad &\text{Tukang besi} \\
 \text{Jumlah tenaga kerja} &= \left(\frac{0,007 \times 25653,3}{6,20 \times 7} \right) \\
 &= 0,24 \\
 \text{Upah tenaga kerja} &= \text{Jumlah tenaga kerja} \times \text{Harga} \\
 &= 0,24 \times \text{Rp}12.857,14 \\
 &= \text{Rp}3.085,71
 \end{aligned}$$

Maka total upah tenaga kerja dengan durasi 7 hari pada pekerjaan pembesian balok *basement* yaitu :

$$\begin{aligned}
 &= (\text{Rp}29.571,43 + \text{Rp}53.228,57 + \text{Rp}5.400,00 + \text{Rp}3.085,71) \times 6,20 \text{ hari} \times \\
 &\quad 7 \text{ jam kerja/hari} \\
 &= \text{Rp}3.963.417,72
 \end{aligned}$$

Berikut tabel hasil penambahan tenaga kerja pada setiap waktu lembur :

Tabel 4.43 Biaya penambahan tenaga kerja waktu lembur 1 jam

Kode	Durasi (Hari)		Biaya	
	Normal	Lembur 1 Jam	Normal	Lembur 1 Jam
BKB	7	6.20	Rp190,091,782.00	Rp190,072,017.40
PBB	7	6.20	Rp257,022,076.00	Rp257,038,309.63
BTB	5	4.43	Rp109,955,666.00	Rp109,964,415.25
PP	7	6.20	Rp150,561,568.00	Rp150,571,609.96
BP	7	6.20	Rp90,950,231.00	Rp90,958,232.40
BKDPL	7	6.20	Rp17,035,282.00	Rp17,050,536.13
PDPL	7	6.20	Rp6,308,160.00	Rp6,316,234.39
BTDPL	5	4.43	Rp6,618,649.00	Rp6,620,766.77
BKPB	14	12.41	Rp408,131,777.00	Rp408,165,562.08
BKK1	7	6.20	Rp96,378,700.00	Rp96,405,406.69
PK1	7	6.20	Rp117,663,848.00	Rp117,665,499.85
BTK1	5	4.43	Rp66,230,312.00	Rp66,238,847.55
BKB1	14	12.41	Rp185,826,970.00	Rp185,821,789.40
BKK2	7	6.20	Rp80,322,294.00	Rp80,340,719.11

Lanjutan Tabel 4.43 Biaya penambahan tenaga kerja waktu lembur 1 jam

Kode	Durasi (Hari)		Biaya	
	Normal	Lembur 1 Jam	Normal	Lembur 1 Jam
PK2	7	6.20	Rp93,846,114.00	Rp93,850,192.71
BTK2	5	4.43	Rp55,818,719.00	Rp55,820,993.65
BKB2	14	12.41	Rp179,468,839.00	Rp179,459,308.00
BKK3	7	6.20	Rp65,574,360.00	Rp65,599,604.52
PK3	7	6.20	Rp79,438,299.00	Rp79,451,411.69
BTK3	5	4.43	Rp47,391,601.00	Rp47,395,367.19
BKB3	14	12.41	Rp146,424,005.00	Rp146,456,801.50
BKK4	7	6.20	Rp58,629,103.00	Rp58,643,105.61
PK4	7	6.20	Rp65,604,089.00	Rp65,612,720.00
BTK4	5	4.43	Rp37,444,019.00	Rp37,452,151.35
BKB4	14	12.41	Rp146,424,005.00	Rp146,456,801.50
BKK5	7	6.20	Rp58,629,103.00	Rp58,643,105.61
PK5	7	6.20	Rp65,604,089.00	Rp65,612,720.00
BTK5	5	4.43	Rp37,444,019.00	Rp37,452,151.35
BKB5	14	12.41	Rp146,424,005.00	Rp146,456,801.50
BKK6	7	6.20	Rp58,629,104.00	Rp58,643,105.61
PK6	7	6.20	Rp65,604,089.00	Rp65,612,720.00
BTK6	5	4.43	Rp37,444,019.00	Rp37,452,151.35
BKB6	14	12.41	Rp146,424,005.00	Rp146,456,801.50
PB6	14	12.41	Rp214,626,377.00	Rp214,642,892.55
BTB6	7	6.20	Rp87,755,446.00	Rp87,763,959.52
BKT6	7	6.20	Rp13,988,950.00	Rp14,001,776.01
PT6	7	6.20	Rp14,858,480.00	Rp14,880,998.98
BTT6	5	4.43	Rp6,651,554.00	Rp6,659,429.62

Tabel 4.44 Biaya penambahan tenaga kerja waktu lembur 2 jam

Kode	Durasi (Hari)		Biaya	
	Normal	Lembur 1 Jam	Normal	Lembur 1 Jam
BKB	7	5.63	Rp190,091,782.00	Rp190,073,336.33
PBB	7	5.63	Rp257,022,076.00	Rp257,035,451.59
BTB	5	4.02	Rp109,955,666.00	Rp109,966,531.14
PP	7	5.63	Rp150,561,568.00	Rp150,569,992.20
BP	7	5.63	Rp90,950,231.00	Rp90,955,020.63
BKDPL	7	5.63	Rp17,035,282.00	Rp17,043,871.13
PDPL	7	5.63	Rp6,308,160.00	Rp6,317,115.17
BDPL	5	4.02	Rp6,618,649.00	Rp6,618,019.43
BKPB	14	11.26	Rp408,131,777.00	Rp408,170,558.08
BKK1	7	5.63	Rp96,378,700.00	Rp96,405,674.04
PK1	7	5.63	Rp117,663,848.00	Rp117,662,539.96
BTK1	5	4.02	Rp66,230,312.00	Rp66,240,431.28
BKB1	14	11.26	Rp185,826,970.00	Rp185,822,445.90
BKK2	7	5.63	Rp80,322,294.00	Rp80,344,383.59
PK2	7	5.63	Rp93,846,114.00	Rp93,854,189.17
BTK2	5	4.02	Rp55,818,719.00	Rp55,825,940.90
BKB2	14	11.26	Rp179,468,839.00	Rp179,474,977.00
BKK3	7	5.63	Rp65,574,360.00	Rp65,599,169.63
PK3	7	5.63	Rp79,438,299.00	Rp79,450,998.27
BTK3	5	4.02	Rp47,391,601.00	Rp47,399,043.43
BKB3	14	11.26	Rp146,424,005.00	Rp146,455,567.50
BKK4	7	5.63	Rp58,629,103.00	Rp58,640,485.58
PK4	7	5.63	Rp65,604,089.00	Rp65,613,528.87
BTK4	5	4.02	Rp37,444,019.00	Rp37,447,939.95
BKB4	14	11.26	Rp146,424,005.00	Rp146,455,567.50
BKK5	7	5.63	Rp58,629,103.00	Rp58,640,485.58
PK5	7	5.63	Rp65,604,089.00	Rp65,613,528.87
BTK5	5	4.02	Rp37,444,019.00	Rp37,447,939.95
BKB5	14	11.26	Rp146,424,005.00	Rp146,455,567.50
BKK6	7	5.63	Rp58,629,104.00	Rp58,640,485.58
PK6	7	5.63	Rp65,604,089.00	Rp65,613,528.87

Lanjutan Tabel 4.44 Biaya penambahan tenaga kerja waktu lembur 2 jam

Kode	Durasi (Hari)		Biaya	
	Normal	Lembur 1 Jam	Normal	Lembur 1 Jam
BTK6	5	4.02	Rp37,444,019.00	Rp37,447,939.95
BKB6	14	11.26	Rp146,424,005.00	Rp146,455,567.50
PB6	14	11.26	Rp214,626,377.00	Rp214,650,187.55
BTB6	7	5.63	Rp87,755,446.00	Rp87,764,126.04
BKT6	7	5.63	Rp13,988,950.00	Rp14,008,141.62
PT6	7	5.63	Rp14,858,480.00	Rp14,884,905.98
BTT6	5	4.02	Rp6,651,554.00	Rp6,663,004.98

Tabel 4.45 Biaya penambahan tenaga kerja waktu lembur 3 jam

Kode	Durasi (Hari)		Biaya	
	Normal	Lembur 1 Jam	Normal	Lembur 1 Jam
BKB	7	5.21	Rp190,091,782.00	Rp190,077,629.37
PBB	7	5.21	Rp257,022,076.00	Rp257,038,309.63
BTB	5	3.72	Rp109,955,666.00	Rp109,963,269.95
PP	7	5.21	Rp150,561,568.00	Rp150,571,609.96
BP	7	5.21	Rp90,950,231.00	Rp90,955,428.06
BKDPL	7	5.21	Rp17,035,282.00	Rp17,049,614.63
PDPL	7	5.21	Rp6,308,160.00	Rp6,316,234.39
BDTDL	5	3.72	Rp6,618,649.00	Rp6,618,023.71
BKPB	14	10.43	Rp408,131,777.00	Rp408,156,915.72
BKK1	7	5.21	Rp96,378,700.00	Rp96,408,379.28
PK1	7	5.21	Rp117,663,848.00	Rp117,665,499.85
BTK1	5	3.72	Rp66,230,312.00	Rp66,239,408.42
BKB1	14	10.43	Rp185,826,970.00	Rp185,822,350.90
BKK2	7	5.21	Rp80,322,294.00	Rp80,341,213.99
PK2	7	5.21	Rp93,846,114.00	Rp93,850,192.71
BTK2	5	3.72	Rp55,818,719.00	Rp55,819,549.06
BKB2	14	10.43	Rp179,468,839.00	Rp179,470,900.00
BKK3	7	5.21	Rp65,574,360.00	Rp65,601,260.73
PK3	7	5.21	Rp79,438,299.00	Rp79,451,411.69

Lanjutan Tabel 4.45 Biaya penambahan tenaga kerja waktu lembur 3 jam

Kode	Durasi (Hari)		Biaya	
	Normal	Lembur 1 Jam	Normal	Lembur 1 Jam
BTK3	5	3.72	Rp47,391,601.00	Rp47,397,762.43
BKB3	14	10.43	Rp146,424,005.00	Rp146,456,603.00
BKK4	7	5.21	Rp58,629,103.00	Rp58,637,483.74
PK4	7	5.21	Rp65,604,089.00	Rp65,612,720.00
BTK4	5	3.72	Rp37,444,019.00	Rp37,450,203.30
BKB4	14	10.43	Rp146,424,005.00	Rp146,456,603.00
BKK5	7	5.21	Rp58,629,103.00	Rp58,637,483.74
PK5	7	5.21	Rp65,604,089.00	Rp65,612,720.00
BTK5	5	3.72	Rp37,444,019.00	Rp37,450,203.30
BKB5	14	10.43	Rp146,424,005.00	Rp146,456,603.00
BKK6	7	5.21	Rp58,629,104.00	Rp58,637,483.74
PK6	7	5.21	Rp65,604,089.00	Rp65,612,720.00
BTK6	5	3.72	Rp37,444,019.00	Rp37,450,203.30
BKB6	14	10.43	Rp146,424,005.00	Rp146,456,603.00
PB6	14	10.43	Rp214,626,377.00	Rp214,642,892.55
BTB6	7	5.21	Rp87,755,446.00	Rp87,765,295.70
BKT6	7	5.21	Rp13,988,950.00	Rp14,007,163.63
PT6	7	5.21	Rp14,858,480.00	Rp14,880,998.98
BTT6	5	3.72	Rp6,651,554.00	Rp6,659,281.15

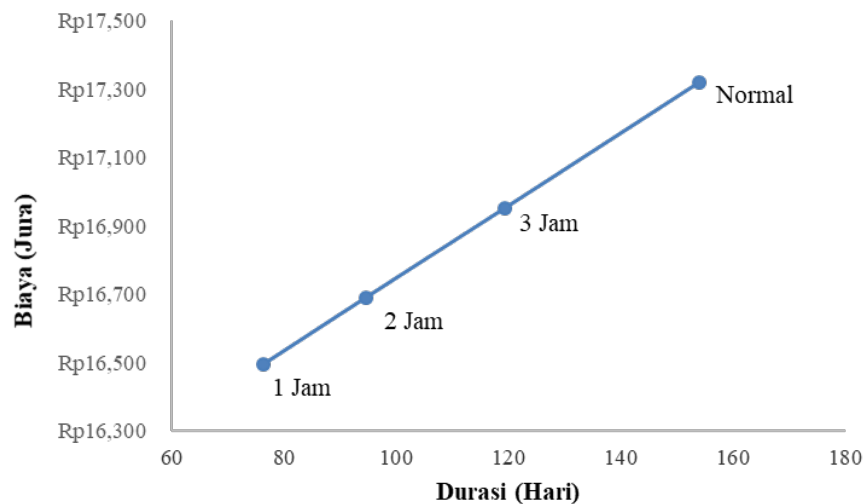
4.3.9 Perbandingan antara penambahan jam lembur dengan penambahan tenaga kerja

Hasil dari analisa metode *Time cost trade off* antara penambahan jam lembur dengan waktu lembur 1 – 3 jam dengan penambahan tenaga kerja didapatkan perbedaan hasil. Berikut adalah tabel analisis dari perbandingan antara penambahan jam lembur dengan penambahan tenaga kerja.

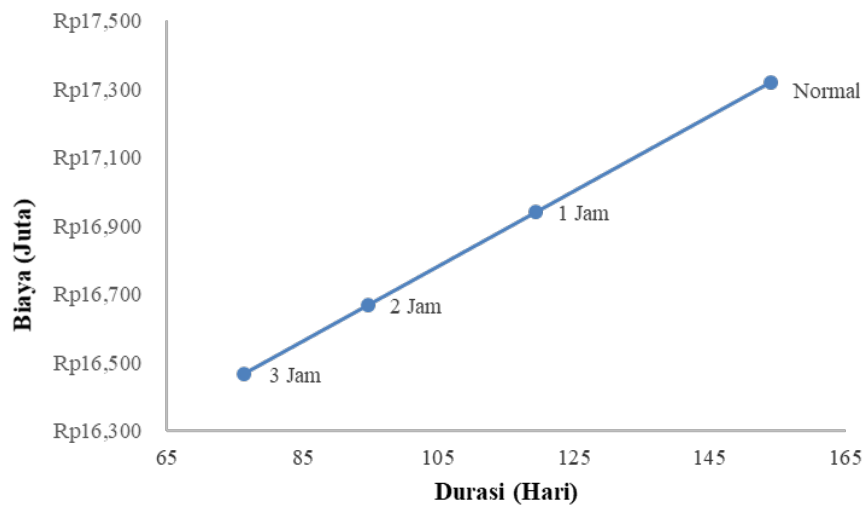
Tabel 4.46 Hasil perbandingan antara biaya penambahan jam lembur dan penambahan tenaga kerja

No.	Penambahan Tenaga	Durasi	Biaya Penambahan Jam Lembur (Rp)	Biaya Penambahan Tenaga Kerja (Rp)
1.	Normal	154	Rp17.322.738.669,00	Rp17.322.738.669,00
2.	1 Jam	119,37	Rp16.952.122.341,01	Rp16.939.852.112,94
3.	2 Jam	94,60	Rp16.689.777.772,10	Rp16.667.132.638,34
4.	3 Jam	76,38	Rp16.494.553.550,74	Rp16.466.536.753,35

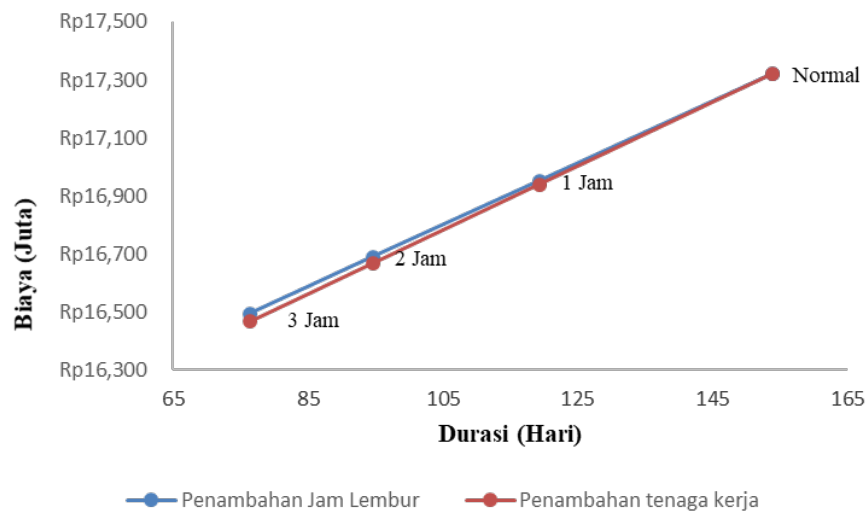
Berikut adalah hasil dalam grafik perbandingan antara penambahan jam lembur dan penambahan tenaga kerja.



Gambar 4.10 Hubungan antara biaya dan durasi terhadap penambahan jam lembur



Gambar 4.11 Hubungan antara biaya dan durasi terhadap penambahan tenaga kerja



Gambar 4.12 Hubungan antara biaya dan durasi terhadap penambahan jam lembur dengan penambahan tenaga kerja

Berikut adalah tabel perbandingan antara penambahan jam lembur dan penambahan tenaga kerja proyek akibat dilakukannya percepatan durasi.

Tabel 4.47 Perbandingan antara penambahan jam lembur dengan penambahan tenaga kerja untuk waktu lembur 1 jam

Kode	Durasi Percepatan (Hari)	Durasi Normal (Hari)	Biaya Penambahan Jam Kerja (Rp)	Biaya Penambahan Tenaga Kerja (Rp)
BKB	6.20	7	16,968,602,219.89	17,311,937,821.96
PBB	6.20	7	17,100,525,294.24	17,080,075,050.06
BTB	4.43	5	17,018,554,114.53	17,150,214,234.33
PP	6.20	7	17,163,195,802.37	17,141,443,193.85
BP	6.20	7	17,010,380,054.09	17,225,396,492.49
BKDPL	6.20	7	17,282,015,867.19	17,088,839,898.87
PDPL	6.20	7	17,311,974,429.56	17,216,623,484.44
BDPL	4.43	5	17,296,983,520.38	17,255,479,338.94
BKPB	12.41	14	16,952,122,341.01	16,939,852,112.94
BKK1	6.20	7	17,108,856,248.68	17,027,497,966.26
PK1	6.20	7	17,177,723,905.55	17,260,469,212.55
BTK1	4.43	5	17,134,409,812.00	17,182,795,041.15
BKB1	12.41	14	16,976,654,864.33	17,275,531,815.25
BKK2	6.20	7	17,140,315,284.75	17,255,479,338.94
PK2	6.20	7	17,230,040,831.55	17,240,433,899.66
BTK2	4.43	5	17,148,754,520.19	17,261,749,422.91
BKB2	12.41	14	16,993,504,677.21	17,294,366,126.08
BKK3	6.20	7	17,154,694,843.93	17,036,252,342.01
PK3	6.20	7	17,179,939,433.50	17,123,906,967.67
BTK3	4.43	5	17,171,713,027.81	17,249,210,903.39
BKB3	12.41	14	17,075,226,737.92	17,009,968,597.88
BKK4	6.20	7	17,119,464,625.35	17,115,139,887.84
PK4	6.20	7	17,224,486,727.48	17,174,022,589.71
BTK4	4.43	5	17,154,760,125.23	17,204,095,345.65
BKB4	12.41	14	17,058,224,702.04	16,992,439,229.50
BKK5	6.20	7	17,104,830,829.69	17,106,372,808.01
PK5	6.20	7	17,209,622,986.82	17,165,250,138.27
BTK5	4.43	5	17,144,501,432.62	17,197,831,276.26
BKB5	12.41	14	17,041,222,666.16	16,974,909,861.12
BKK6	6.20	7	17,090,197,034.03	17,097,605,727.18
PK6	6.20	7	17,194,759,246.16	17,156,477,686.82
BTK6	4.43	5	17,134,098,421.00	17,238,956,368.71
BKB6	12.41	14	17,024,220,630.27	16,957,380,492.74
PB6	12.41	14	16,971,728,239.23	17,062,529,400.72
BTB6	6.20	7	16,928,850,464.26	17,189,058,707.34
BKT6	6.20	7	17,239,350,468.14	17,132,674,937.42

Tabel 4.48 Perbandingan antara penambahan jam lembur dengan penambahan tenaga kerja untuk waktu lembur 2 jam

Kode	Durasi Percepatan (Hari)	Durasi Normal (Hari)	Biaya Penambahan Jam Kerja (Rp)	Biaya Penambahan Tenaga Kerja (Rp)
BKB	6.20	7	16,718,040,835.42	17,305,658,928.67
PBB	6.20	7	16,943,081,886.92	16,922,866,315.05
BTB	4.43	5	16,803,801,277.38	17,008,859,183.38
PP	6.20	7	17,050,618,760.10	17,120,667,558.19
BP	6.20	7	16,789,696,174.72	17,202,391,570.35
BKDPL	6.20	7	17,254,317,575.80	17,260,469,212.55
PDPL	6.20	7	17,305,701,912.34	17,075,509,898.55
BTDPL	4.43	5	17,279,989,835.07	17,249,710,515.37
BKPB	12.41	14	16,689,777,772.10	16,667,132,638.34
BKK1	6.20	7	16,957,370,696.58	16,817,580,553.85
PK1	6.20	7	17,075,537,037.37	17,260,469,212.55
BTK1	4.43	5	17,001,202,729.55	17,019,606,385.85
BKB1	12.41	14	16,731,852,549.08	17,275,531,815.25
BKK2	6.20	7	17,011,333,687.17	16,892,785,006.95
PK2	6.20	7	17,165,163,136.84	17,135,720,428.65
BTK2	4.43	5	17,025,808,459.82	17,161,524,273.32
BKB2	12.41	14	16,760,753,171.40	17,172,275,119.04
BKK3	6.20	7	17,036,037,177.44	16,847,649,743.15
PK3	6.20	7	17,179,939,433.50	16,937,914,234.12
BTK3	4.43	5	17,065,227,497.76	17,150,773,648.14
BKB3	12.41	14	16,899,690,038.94	16,787,489,527.04
BKK4	6.20	7	17,119,464,625.35	16,983,062,654.67
PK4	6.20	7	17,195,062,349.33	17,060,458,043.77
BTK4	4.43	5	17,103,951,177.96	17,228,202,222.04
BKB4	12.41	14	16,870,529,613.62	16,757,398,500.22
BKK5	6.20	7	17,011,333,687.17	16,968,012,742.59
PK5	6.20	7	17,175,640,907.31	17,045,406,188.98
BTK5	4.43	5	17,090,491,624.67	17,217,448,075.38
BKB5	12.41	14	16,841,369,188.31	16,727,307,473.40
BKK6	6.20	7	17,019,534,870.32	16,952,962,829.51
PK6	6.20	7	17,156,219,465.29	17,030,354,334.19
BTK6	4.43	5	17,076,898,542.37	17,238,956,368.71
BKB6	12.41	14	16,899,690,038.94	16,697,216,446.58
PB6	12.41	14	16,864,719,976.34	16,862,686,228.18
BTB6	6.20	7	16,808,695,520.29	17,090,562,238.04
BKT6	6.20	7	17,214,483,791.34	16,907,824,212.02

Tabel 4.49 Perbandingan antara penambahan jam lembur dengan penambahan tenaga kerja untuk waktu lembur 3 jam

Kode	Durasi Percepatan (Hari)	Durasi Normal (Hari)	Biaya Penambahan Jam Kerja (Rp)	Biaya Penambahan Tenaga Kerja (Rp)
BKB	6.20	7	16,531,486,838.77	17,301,044,927.35
PBB	6.20	7	16,827,290,901.30	16,800,801,487.74
BTB	4.43	5	16,643,583,496.86	17,064,930,751.73
PP	6.20	7	16,967,803,923.99	16,859,796,575.83
BP	6.20	7	16,625,116,761.85	17,135,182,679.94
BKDPL	6.20	7	17,233,948,572.36	16,820,464,843.12
PDPL	6.20	7	17,301,089,393.98	17,031,210,114.96
BTDPL	4.43	5	17,267,492,808.67	17,247,623,655.64
BKPB	12.41	14	16,494,553,550.74	16,643,492,983.21
BKK1	6.20	7	16,845,959,857.32	16,623,843,073.47
PK1	6.20	7	17,000,361,566.31	17,213,889,699.23
BTK1	4.43	5	16,903,233,584.37	16,899,135,862.21
BKB1	12.41	14	16,549,533,776.78	17,261,681,130.22
BKK2	6.20	7	16,916,471,357.66	16,722,136,780.84
PK2	6.20	7	17,117,545,990.26	17,154,857,071.89
BTK2	4.43	5	16,935,383,652.68	17,233,567,636.40
BKB2	12.41	14	16,587,296,611.82	17,174,532,582.20
BKK3	6.20	7	16,948,750,171.98	16,682,827,022.52
PK3	6.20	7	17,136,854,047.28	16,840,130,099.51
BTK3	4.43	5	16,986,891,561.01	17,121,131,992.07
BKB3	12.41	14	16,770,591,709.26	16,584,516,493.44
BKK4	6.20	7	17,057,777,318.35	17,011,538,906.68
PK4	6.20	7	17,195,062,349.33	16,952,525,531.12
BTK4	4.43	5	17,103,951,177.96	17,093,030,662.08
BKB4	12.41	14	16,732,487,898.22	16,545,189,913.41
BKK5	6.20	7	17,038,656,094.34	16,991,867,698.41
PK5	6.20	7	17,175,640,907.31	16,932,854,573.10
BTK5	4.43	5	17,090,491,624.67	17,078,979,997.08
BKB5	12.41	14	16,694,384,087.19	16,505,863,333.38
BKK6	6.20	7	17,019,534,870.32	16,972,196,489.13
PK6	6.20	7	17,156,219,465.29	16,913,183,615.08
BTK6	4.43	5	17,076,898,542.37	17,107,081,327.07
BKB6	12.41	14	16,656,280,276.16	16,466,536,753.35
PB6	12.41	14	16,864,719,976.34	16,761,458,825.25
BTB6	6.20	7	16,808,695,520.29	16,879,466,122.89
BKT6	6.20	7	17,214,483,791.34	16,741,797,449.87

Suatu proyek akan dikenakan denda jika mengalami keterlambatan, berikut adalah tabel hasil perhitungan denda jika mengalami keterlambatan.

Tabel 4.50 Perbandingan antara penambahan jam lembur dengan penambahantenaga kerja dan denda untuk waktu lembur 1 jam

Kode	Durasi Percepatan (Hari)	Biaya Penambahan Jam Kerja (Rp)	Biaya Penambahan Tenaga Kerja (Rp)	Denda (Rp)
BKB	6.20	16,968,602,219.89	17,311,937,821.96	13,812,740.96
PBB	6.20	17,100,525,294.24	17,080,075,050.06	13,812,740.96
BTB	4.43	17,018,554,114.53	17,150,214,234.33	9,866,243.55
PP	6.20	17,163,195,802.37	17,141,443,193.85	13,812,740.96
BP	6.20	17,010,380,054.09	17,225,396,492.49	13,812,740.96
BKDPL	6.20	17,282,015,867.19	17,088,839,898.87	13,812,740.96
PDPL	6.20	17,311,974,429.56	17,216,623,484.44	13,812,740.96
BTDPL	4.43	17,296,983,520.38	17,255,479,338.94	9,866,243.55
BKPB	12.41	16,952,122,341.01	16,939,852,112.94	27,625,481.93
BKK1	6.20	17,108,856,248.68	17,027,497,966.26	13,812,740.96
PK1	6.20	17,177,723,905.55	17,260,469,212.55	13,812,740.96
BTK1	4.43	17,134,409,812.00	17,182,795,041.15	9,866,243.55
BKB1	12.41	16,976,654,864.33	17,275,531,815.25	27,625,481.93
BKK2	6.20	17,140,315,284.75	17,255,479,338.94	13,812,740.96
PK2	6.20	17,230,040,831.55	17,240,433,899.66	13,812,740.96
BTK2	4.43	17,148,754,520.19	17,261,749,422.91	9,866,243.55
BKB2	12.41	16,993,504,677.21	17,294,366,126.08	27,625,481.93
BKK3	6.20	17,154,694,843.93	17,036,252,342.01	13,812,740.96
PK3	6.20	17,179,939,433.50	17,123,906,967.67	13,812,740.96
BTK3	4.43	17,171,713,027.81	17,249,210,903.39	9,866,243.55
BKB3	12.41	17,075,226,737.92	17,009,968,597.88	27,625,481.93
BKK4	6.20	17,119,464,625.35	17,115,139,887.84	13,812,740.96
PK4	6.20	17,224,486,727.48	17,174,022,589.71	13,812,740.96
BTK4	4.43	17,154,760,125.23	17,204,095,345.65	9,866,243.55
BKB4	12.41	17,058,224,702.04	16,992,439,229.50	27,625,481.93
BKK5	6.20	17,104,830,829.69	17,106,372,808.01	13,812,740.96
PK5	6.20	17,209,622,986.82	17,165,250,138.27	13,812,740.96
BTK5	4.43	17,144,501,432.62	17,197,831,276.26	9,866,243.55
BKB5	12.41	17,041,222,666.16	16,974,909,861.12	27,625,481.93
BKK6	6.20	17,090,197,034.03	17,097,605,727.18	13,812,740.96
PK6	6.20	17,194,759,246.16	17,156,477,686.82	13,812,740.96
BTK6	4.43	17,134,098,421.00	17,238,956,368.71	9,866,243.55
BKB6	12.41	17,024,220,630.27	16,957,380,492.74	27,625,481.93

Lanjutan tabel 4.46 Perbandingan antara penambahan jam lembur dengan penambahan tenaga kerja dan denda untuk waktu lembur 1 jam

Kode	Durasi Percepatan (Hari)	Biaya Penambahan Jam Kerja (Rp)	Biaya Penambahan Tenaga Kerja (Rp)	Denda (Rp)
BTB6	6.20	16,928,850,464.26	17,189,058,707.34	13,812,740.96
BKT6	6.20	17,239,350,468.14	17,132,674,937.42	13,812,740.96
PT6	6.20	17,290,684,821.68	17,045,008,179.93	13,812,740.96
BTT6	4.43	17,269,294,848.46	17,234,169,573.53	9,866,243.55

Tabel 4.51 Perbandingan antara penambahan jam lembur dengan penambahan tenaga kerja dan denda untuk waktu lembur 2 jam

Kode	Durasi Percepatan (Hari)	Biaya Penambahan Jam Kerja (Rp)	Biaya Penambahan Tenaga Kerja (Rp)	Denda (Rp)
BKB	6.20	16,718,040,835.42	17,305,658,928.67	23,691,585.08
PBB	6.20	16,943,081,886.92	16,922,866,315.05	23,691,585.08
BTB	4.43	16,803,801,277.38	17,008,859,183.38	16,922,560.77
PP	6.20	17,050,618,760.10	17,120,667,558.19	23,691,585.08
BP	6.20	16,789,696,174.72	17,202,391,570.35	23,691,585.08
BKDPL	6.20	17,254,317,575.80	17,260,469,212.55	23,691,585.08
PDPL	6.20	17,305,701,912.34	17,075,509,898.55	23,691,585.08
BTDPL	4.43	17,279,989,835.07	17,249,710,515.37	16,922,560.77
BKPB	12.41	16,689,777,772.10	16,667,132,638.34	47,383,170.15
BKK1	6.20	16,957,370,696.58	16,817,580,553.85	23,691,585.08
PK1	6.20	17,075,537,037.37	17,260,469,212.55	23,691,585.08
BTK1	4.43	17,001,202,729.55	17,019,606,385.85	16,922,560.77
BKB1	12.41	16,731,852,549.08	17,275,531,815.25	47,383,170.15
BKK2	6.20	17,011,333,687.17	16,892,785,006.95	23,691,585.08
PK2	6.20	17,165,163,136.84	17,135,720,428.65	23,691,585.08
BTK2	4.43	17,025,808,459.82	17,161,524,273.32	16,922,560.77
BKB2	12.41	16,760,753,171.40	17,172,275,119.04	47,383,170.15
BKK3	6.20	17,036,037,177.44	16,847,649,743.15	23,691,585.08
PK3	6.20	17,179,939,433.50	16,937,914,234.12	23,691,585.08
BTK3	4.43	17,065,227,497.76	17,150,773,648.14	16,922,560.77
BKB3	12.41	16,899,690,038.94	16,787,489,527.04	47,383,170.15
BKK4	6.20	17,119,464,625.35	16,983,062,654.67	23,691,585.08
PK4	6.20	17,195,062,349.33	17,060,458,043.77	23,691,585.08
BTK4	4.43	17,103,951,177.96	17,228,202,222.04	16,922,560.77
BKB4	12.41	16,870,529,613.62	16,757,398,500.22	47,383,170.15
BKK5	6.20	17,011,333,687.17	16,968,012,742.59	23,691,585.08

Lanjutan tabel 4.47 Perbandingan antara penambahan jam lembur dengan penambahan tenaga kerja dan denda untuk waktu lembur 2 jam

Kode	Durasi Percepatan (Hari)	Biaya Penambahan Jam Kerja (Rp)	Biaya Penambahan Tenaga Kerja (Rp)	Denda (Rp)
PK5	6.20	17,175,640,907.31	17,045,406,188.98	23,691,585.08
BTK5	4.43	17,090,491,624.67	17,217,448,075.38	16,922,560.77
BKB5	12.41	16,841,369,188.31	16,727,307,473.40	47,383,170.15
BKK6	6.20	17,019,534,870.32	16,952,962,829.51	23,691,585.08
PK6	6.20	17,156,219,465.29	17,030,354,334.19	23,691,585.08
BTK6	4.43	17,076,898,542.37	17,238,956,368.71	16,922,560.77
BKB6	12.41	16,899,690,038.94	16,697,216,446.58	47,383,170.15
PB6	12.41	16,864,719,976.34	16,862,686,228.18	47,383,170.15
BTB6	6.20	16,808,695,520.29	17,090,562,238.04	23,691,585.08
BKT6	6.20	17,214,483,791.34	16,907,824,212.02	23,691,585.08
PT6	6.20	17,281,467,263.97	16,832,614,874.47	23,691,585.08
BTT6	4.43	17,253,518,353.37	16,998,112,566.75	16,922,560.77

Tabel 4.52 Perbandingan antara penambahan jam lembur dengan penambahan tenaga kerja dan denda untuk waktu lembur 3 jam

Kode	Durasi Percepatan (Hari)	Biaya Penambahan Jam Kerja (Rp)	Biaya Penambahan Tenaga Kerja (Rp)	Denda (Rp)
BKB	6.20	16,531,486,838.77	17,301,044,927.35	30,956,213.79
PBB	6.20	16,827,290,901.30	16,800,801,487.74	30,956,213.79
BTB	4.43	16,643,583,496.86	17,064,930,751.73	22,111,581.28
PP	6.20	16,967,803,923.99	16,859,796,575.83	30,956,213.79
BP	6.20	16,625,116,761.85	17,135,182,679.94	30,956,213.79
BKDPL	6.20	17,233,948,572.36	16,820,464,843.12	30,956,213.79
PDPL	6.20	17,301,089,393.98	17,031,210,114.96	30,956,213.79
BDPL	4.43	17,267,492,808.67	17,247,623,655.64	22,111,581.28
BKPB	12.41	16,494,553,550.74	16,643,492,983.21	61,912,427.58
BKK1	6.20	16,845,959,857.32	16,623,843,073.47	30,956,213.79
PK1	6.20	17,000,361,566.31	17,213,889,699.23	30,956,213.79
BTK1	4.43	16,903,233,584.37	16,899,135,862.21	22,111,581.28
BKB1	12.41	16,549,533,776.78	17,261,681,130.22	61,912,427.58
BKK2	6.20	16,916,471,357.66	16,722,136,780.84	30,956,213.79
PK2	6.20	17,117,545,990.26	17,154,857,071.89	30,956,213.79
BTK2	4.43	16,935,383,652.68	17,233,567,636.40	22,111,581.28
BKB2	12.41	16,587,296,611.82	17,174,532,582.20	61,912,427.58
BKK3	6.20	16,948,750,171.98	16,682,827,022.52	30,956,213.79

Lanjutan tabel 4.48 Perbandingan antara penambahan jam lembur dengan penambahantenaga kerja dan denda untuk waktu lembur 3 jam

Kode	Durasi Percepatan (Hari)	Biaya Penambahan Jam Kerja (Rp)	Biaya Penambahan Tenaga Kerja (Rp)	Denda (Rp)
PK3	6.20	17,136,854,047.28	16,840,130,099.51	30,956,213.79
BTK3	4.43	16,986,891,561.01	17,121,131,992.07	22,111,581.28
BKB3	12.41	16,770,591,709.26	16,584,516,493.44	61,912,427.58
BKK4	6.20	17,057,777,318.35	17,011,538,906.68	30,956,213.79
PK4	6.20	17,195,062,349.33	16,952,525,531.12	30,956,213.79
BTK4	4.43	17,103,951,177.96	17,093,030,662.08	22,111,581.28
BKB4	12.41	16,732,487,898.22	16,545,189,913.41	61,912,427.58
BKK5	6.20	17,038,656,094.34	16,991,867,698.41	30,956,213.79
PK5	6.20	17,175,640,907.31	16,932,854,573.10	30,956,213.79
BTK5	4.43	17,090,491,624.67	17,078,979,997.08	22,111,581.28
BKB5	12.41	16,694,384,087.19	16,505,863,333.38	61,912,427.58
BKK6	6.20	17,019,534,870.32	16,972,196,489.13	30,956,213.79
PK6	6.20	17,156,219,465.29	16,913,183,615.08	30,956,213.79
BTK6	4.43	17,076,898,542.37	17,107,081,327.07	22,111,581.28
BKB6	12.41	16,656,280,276.16	16,466,536,753.35	61,912,427.58
PB6	12.41	16,864,719,976.34	16,761,458,825.25	61,912,427.58
BTB6	6.20	16,808,695,520.29	16,879,466,122.89	30,956,213.79
BKT6	6.20	17,214,483,791.34	16,741,797,449.87	30,956,213.79
PT6	6.20	17,281,467,263.97	16,702,479,710.81	30,956,213.79
BTT6	4.43	17,253,518,353.37	17,050,881,629.59	22,111,581.28

4.3.10 Perhitungan Biaya Denda Keterlambatan

Menentukan biaya denda keterlambatan suatu proyek dapat dihitung menggunakan persamaan sebagai berikut ini.

Total denda = total hari keterlambatan × denda perhari

Denda perhari sebesar 1 ‰ (satu permil) dari nilai kontrak.

Sehingga analisis perhitungan biaya denda keterlambatan adalah sebagai berikut ini.

Kegiatan : Pemesian Balok *Basement*

Total hari keterlambatan = 0,80 hari

Biaya total proyek = Rp.17.322.738.669,00

$$\begin{aligned} \text{Total denda} &= 0,80 \times 1/1000 \times \text{Rp.}17.322.738.669,00 \\ &= \text{Rp.}13.812.740,96 \end{aligned}$$