

3. Construction Schedule

3.1. Preparation Construction . . . Preparation work: 3 months、 Clearance: 3 months

(1) Preparation Construction . . . 3months

The following items including study items may be considered as preliminary works, and all items above should be implemented within three months.

1) Planning

2) Investigation

①Home investigation

②Well investigation

③Water sentence and groundwater investigation

3) Surveying

①Basic surveying (temporary B M、 reference point setting)

②Construction surveying

(2) Clearance 3 months

3.2. Existing roadbed Improvement work . . . 8 months

Improvement of existing roadbeds is carried out within sections that are severely damaged due to mud pumping.

(1) Target Extension

①Section A (between Lahat and Muara Enim) $L=8,787m$.

②Section C (between Prabumulih and Kertapati) $L=19,324m$.

③Total extension $L=28,111m=28.1km$. (Target Volume $V=78,711m^3$)

(2) Term of Works

Construction rate is set to 20-30m/day/track per one party (10 manpower), i.e., 40 days per km.

$N=28.1km \times 40days \text{ per km} = 1124 \text{ days}$, $1124 \text{ days per } 30 \text{ days} = 37.5 \text{ months}$.

When it is said that I spend 5 groups, $37.5 \text{ months per } 5 \text{ groups} \doteq 7.5 \text{ months}$.

→ 8.0 months.

3.3. Track Rehabilitation Work

(1) Track Rehabilitation Work (Section A and Section B) . . . 21 months

Replacement of track material, replenishment of ballast, and the like within sections that are severely damaged.

1) Target Extension

①Section A (between Lahat and Muara Enim) $L=38.07\text{km}$.

②Section B (between Muara Enim and Prabumulih) $L=70.58\text{km}$.

③Total extension $L=108.65\text{km}=108,650\text{m}$.

2) Term of Works

Length to be actually improved may be considered to be about one third of a target length, but the schedule will be calculated based on the whole length due to the necessity of inspection over the whole length.

Construction rate is set to 30 m / day / track per one party (10 manpower), i.e., 30 days per km.

$N=108.65\text{km}\times 30\text{ days per km}=3260\text{ days}$.

$3260\text{ days per }30\text{ days}=108.7\text{ months}$.

When it is said that I spend five groups, $108.7\text{ months per }5\text{ groups} \doteq 21.7\text{ months}$.

→ 21 months are required.

The same period will also be ensured within a critical path in the second phase, including possible repair.

(2) The 1st Stage Enforcement:R54 track exchange work (C section) . . . 27 months

Sleeper replacement work, which is included in track replacement works from R42 to R54, is carried out in advance.

1) Target Extension

• Section C (between Prabumulih X6 and Kertapati) $L=80.6\text{km}$.

2) Term of Works

Assuming that a train interval is 1.5 hours and 5 works per day are carried out, construction rate is set to 10-15 m/day/track per one party (10 manpower), i.e., 80 days per km.

Allocating one group per 10 km results in allocating eight groups as a whole.

Therefore, the work days, $N=80.6\text{km}\times 80\text{days per km}=6448\text{days}$,

$6448\text{ days per }30\text{ days}=214.9\text{ months}$, $214.9\text{ months per }8\text{ groups}=26.9\text{ months}$

→ 27 months are required.

(3) The 2nd Stage Enforcement:R54 track exchange work(C section) . . . 21 months

Rail exchange work, which is included in track replacement works from R42 to R54, is carried out.

1) Target Extension

• Section C (between Prabumulih X6 and Kertapati) $L=80.6\text{km}$.

2) Term of Works

Since a critical path in the second phase consists of bridge work and track laying work in

construction works for double tracking (1) (B section), the schedule is set to 21 months of the period.

3.4. Improvement Work of Civil Engineering Facilities

The 1st stage 27 months, the 2nd stage 18 months, the 3rd stage 18 months.

(1) Improvement Work of Station Facilities

The 1st stage 27 months, the 2nd stage 18 months, the 3rd stage 18 months.

1) The 1st Stage

(400m, 4 places, Total extension $L=58+175+263+58=554m$)

There is few it for the work load, but the schedule is set during critical path 27 months because it is dotted.

2) The 2nd stage

(700m, 6 places, Total extension $L=207+239+300\times 4=1646m$)

Because it does not become the critical path, the schedule is set it by a reason like the above in around 18 months.

3) The 3rd stage

(1000m,10 places, all out deferred extension $L=294+300\times 8+339=3033m$)

Because it does not become the critical path, the schedule is set around 18 months.

(2) Improvement and New Installation Work of Signal and Telecom Equipment

• • • 18 months.

1) The 2nd Stage

(700m, 2 places of new establishments by for each one place of the section of A and C in total.

Total extension $L=700+700=1400m$)

Because it does not become the critical path, the schedule is set around 18 months.

2) The 3rd stage (1000m,2 places, Total Extension $L=300+300=600m$)

Because it does not become the critical path, the schedule is set around 18 months.

3.5. Branch Line Construction between Merapi and Coal Storage Yard

Because it does not become the critical path, the schedule is set around 18 months.

3.6. Double Tracking

3.6.1. Double Tracking (2), (3) :(Section A and C)

The 3rd stage (Target Extension $27.54+80.6=108.14km$)

(1) Site Access Road

1) Between Kertapati and Prabumulih

Because there is not the section concerned in the slip road apart from a national highway in a damp area part either, the road for construction is installed at 6.0m in width parallel to a plan line outside of a plan line.

In addition, because the basic ground is soft, the road for construction gives a soil stabilization by cement of 1.0m and does it with the structure that 1.0m extra earth laid on the ground did on the top.

- Site Access Road, Width=6.0m、 Extension=20km.
- Soil Stabilization by Cement, Area=6.0m×20,000m=120,000.0m²
- Embankment: Volume=6.0m×1.0m×20000m=120,000.0m³ (purchase soil)
- Cost of Construction: M=2,500 yen per m³×120,000m³+2300 yen per m²×120,000.0m²
=576,000,000 yen .(local cost)

→The cost of construction includes 50% in consideration of Indonesia and a Japanese price level.

$$=288,000,000 \text{ yen.}$$

(When We convert it as 1 yen =110Rp,26,180 ≐ 31,680 million Rp.) (local cost)

- Term of Works : N=120,000.0m³ per 600m³ per day per / 5 groups+120,000m³ / 200m² per day / 5 groups=160 days.
≐ 5.0~6.0 months.

2) Between Muara Enim and Lahat

A national highway parallels the section concerned and because the ground is good, the road for construction uses a trajectory planning line to use in the future as a double track.

Therefore, it is the simple management and the road for construction shall include it in permanent work cost include it to easily for a cost of construction, term of works because the slip road formation is possible.

(2) Ground Improvement Work

Double track section (Pyakabung - Kertapati interval) of 20.8km belongs to the damp ground part and carries out a ground improvement by the pile net method of construction because the basic ground is soft. (6m in width, extension 20.8km)

The construction speed assumes it 150m² per day (25m in depth) per one group, when spend five groups, the construction days is,

$$N = (6\text{m} \times 20800\text{m}) / (150\text{m}^2 \text{ per day}) \text{ per } 5 \text{ groups} \doteq 166\text{days.}$$

→166days per 30days ≐ 6 months →6 months are required.

(3) Drainage Work

Drainage work carry out the during a roadwork for construction, a period same as ground improved construction.

12 months are required.

(4) Civil work

Because the cost of work multiplies it separately, the earthwork calculate only term of works.

1) Embankment

① Quantity

- Between Muara Enim and Lahat $V=209,979\text{m}^3$.
- Between Kertapati and Prabumulih $V=293,137\text{m}^3$, Total $V=587,116\text{m}^3$.

② Term of Works

- Bulldozer Spreading, Compaction 600mm^3 per day.
 $N=587,116\text{m}^3 / 600\text{mm}^3=979\text{days}$, $979\text{days} / 30\text{days per month} \doteq 33$ months.
When it is said that I spend 4 groups, 33 months / 4 groups $\doteq 8$ months.
- Compaction of pneumatic-tire roller 600mm^3 per day.
 $N=587,116 / 600=979\text{days}$, $979\text{days} / 30\text{day per month} \doteq 33$ months.
When it is said that I spend 4 groups, 33 months / 4 groups $\doteq 8$ months.
- Term of Works $N=8+8=16$ months.

2) Cut Work

① Quantity

- Between Muara Enim and Lahat $V=228,882\text{m}^3$.
- Between Kertapati and Prabumulih $V=330,334\text{m}^3$, Total $V=559,214\text{m}^3$.

② Term of Works

- Excavation: backhoe 300m^3 per day, quantity of target soil (we assume it one-third of cut)
 $V=186,400\text{m}^3$.
 $N=186,400\text{m}^3 / 300\text{m}^3=621\text{days}$, $621\text{days} / 30\text{days per month} \doteq 21$ months.
- Quantity of digging soil: Bulldozer 350m^3 per day, quantity of target soil
 $V=372,814\text{m}^3$.
 $N=372,814 / 350=1065\text{days}$, $1065 / 30\text{days per month} \doteq 36$ months.
- Compaction of Pneumatic-tire roller 700m^2 per day.
target area $A=6.0\text{m} \times 51,951\text{m}=311,706\text{m}^2$.
 $N=311,706 / 700=445\text{days}$, $445\text{days} / 30\text{days per month} \doteq 15$ months.
- Term of Works
 $N=21+36+15=72$ months.

When it is said that I spend 4 groups, $N=72/4 \doteq$ **18 months.**

3) Term of Civil work

Embankment section and cut section shall undertake construction at the same time and do it with 18 months for the term of works.

(5) Temporary Work

The falsework between, ① Kertapati – Prabumulih, ② Muara Enim – Lahat becoming the section targeted for a double track includes steel sheet pilings earth retaining closure and piled pier for construction.

1) Piled Pier for Work

① Cost of Work

■ Bearing Pile

(H-300×300, L=10m per pile, all weight $W=736.2t$, All number $N=792$)

• Material cost (all loss) : $79,000 \text{ yen per } t \times 736.2t = 58,159,800 \text{ yen. (foreign cost)}$

• Cost of punch (vibro) :

$(12,360 \text{ yen} + 4,700 \text{ yen}) \text{ per pile} \times 792 \text{ piles} = 13,511,520 \text{ yen. (local cost)}$

• Subtotal: $71,671,320 \text{ yen.}$

■ Cross Beam Decking (H-300×300, all weight $W=810.8t$)

• Material cost (all loss) $79,000 \text{ yen per } t \times 810.8t = 64,053,200 \text{ yen. (foreign cost)}$

• Setting • removal cost

$(22,710 \text{ yen} + 12,670 \text{ yen}) \text{ per } t \times 810.8t = 28,686,104 \text{ yen. (local cost)}$

• Subtotal $92,739,304 \text{ yen.}$

■ Decking (all setting area $A=5650m^2$)

• Material Cost (all loss) :

$(450 \text{ yen per } m^2 \times 36 \text{ months}) \times 5650m^2 = 91,530,000 \text{ yen. (local cost)}$

• Setting • Removal cost: $(1500 \text{ yen} + 800 \text{ yen}) \text{ per } m^2 \times 5650m^2 = 12,995,000 \text{ yen. (local cost)}$

• Subtotal $104,525,000 \text{ yen.}$

■ Total: $268,935,624 \text{ yen. (foreign cost } 122,213,000 \text{ and local cost } 146,722,624)$

• The cost of construction includes 50% in consideration of a price level and assumes it $195,574,312 \text{ yen.}$

• Unit price of Indonesia: $195.6 \times 110 \doteq 21,516 \text{ million Rp. (foreign cost } 13,443, \text{ local cost } 8,073)$

② Term of Works (It calculate s at the longest 160m pier)

• Bearing pile punching: $(205 \text{ piles per point} / 10 \text{ piles per day}) +$
 $(205 \text{ piles per point} / 20 \text{ piles per day}) \doteq 31 \text{ days.}$

- Cross beam decking setting, removal: $(221.9t \text{ per point} / 10t \text{ per day}) + (221.9t \text{ per point} / 20t \text{ per day}) \doteq 33 \text{ days.}$
- Decking setting • removal: $(1600m^2 \text{ per } 150m^2 \text{ per day}) \times 2 \doteq 22 \text{ days.}$
- The work days per one group: 86 days.
- Term of Works: Both sides undertake construction in two groups, 86 days per 2 groups $\doteq 43 \text{ days.} \rightarrow 40 \text{ days are required.}$

2) Steel Sheet Closure

① Cost of Work

■ Steel Sheet Pilings (III Form, Average $L \doteq 7.5m$ per pile, All weight $W=1311.8t$, All number of sheets $N=3008$ piles)

- Material cost (all loss) : $127,000 \text{ yen per t} \times 1311.8t = 166,598,600 \text{ yen. (foreign cost)}$
- Cost of placing (vibrator) :
- $(6,800\text{yen}+4,700\text{yen}) \text{ per sheet} \times 3008 \text{ piles} = 34,592,000 \text{ yen. (local cost)}$
- Subtotal: 201,190,600 yen

■ Earth retaining Support ($H=300 \times 300$, all weight $W=185.4t$)

- Material Cost (all loss) $79,000 \text{ yen per t} \times 185.4 \text{ t} = 14,646,600 \text{ yen. (foreign cost)}$
- Setting • Removal Cost: $(22,710\text{yen}+12,670\text{yen}) \text{ per t} \times 185.4 \text{ t} = 6,559,452 \text{ yen. (local cost)}$
- Subtotal 21,206,052 yen.

■ Total: 222,396,652 yen. (foreign cost 181,245,200 and local cost 41,151,452)

- The cost of work includes 50% in consideration of a price level and assumes it 201,820,926 yen.
- Unit price of Indonesia: $201.8 \times 110 \doteq 22,198 \text{ million Rp. (foreign cost } 19,936 \text{ and local cost } 2,262)$

② Term of Works (By one hit)

- Steel Sheet Pile Punching: $(100 \text{ piles per point} / 10 \text{ piles per day}) + (100 \text{ piles per point} / 20 \text{ piles per day}) \doteq 25 \text{ days.}$
- Earth Retaining Support Setting • Removal: $(7.44t \text{ per one} / 10t \text{ per day}) + (7.44t \text{ per point} / 20t \text{ per day}) \doteq 2 \text{ days.}$
- The work days per one: 27 days.
- Term of Works: It includes one abutment pier and one bridge pier for the term_of works.
 $\rightarrow 50 \text{ months are required.}$

3) Temporary work term of works: $N=40+50=90 \text{ days} \rightarrow 3 \text{ months are required.}$

(6) Bridge work

Superstructure 6 months, substructure 12 months. Total: 18 months.

In addition, the work of all bridges assumes its construction at the same time.

(7) New Track Bed Work

1) Quantity

① Between Muara Enim and Lahat $L=19,507+17130=36,637\text{m}$

$$A=163,860+130,188=294,048\text{m}^2.$$

$$V=40,965+32,547=73,512\text{m}^3. (\text{thickness}=25\text{cm})$$

② Between Kertapati and Prabumulih $L=39,521+34,821=74,342\text{m}$.

$$A=331,976+264,640=596,616\text{m}^2.$$

$$V=82,994+66,160=149,154\text{m}^3. (\text{thickness}=25\text{cm})$$

③ Total

$$A=294,048+596,616=890,664\text{m}^2.$$

$$V=73,512+149,154=222,666\text{m}^3. (\text{thickness}=25\text{cm})$$

2) Term of Works

① Track Bed

The track bed assumes two levels of finish by a motor grader, a road roller, the combination of tire rollers.

The quantity of construction assumes it 1200m^3 per day.

$$N=890,664\text{m}^2/1200\times 2=742 \text{ days}\times 2=1484 \text{ days}, 1484 \text{ days} / 30 \text{ days}=49 \text{ months}.$$

$$\text{When I spend 8 groups, } 49 \text{ months} / 8 \text{ groups} \doteq 6 \text{ months}.$$

② Asphalt Pavement: coarse-graded asphalt concrete $t=5\text{cm}$ (finish it still more)

It of an asphalt finisher, a road roller, a tire roller, the vibratory roller put together.

The quantity of construction per day assumes it $2,300\text{m}^2$ per day.

$$N=890,664\text{m}^2\div 2300\text{m}^2=387\text{days}, 387\text{days}/30 \text{ days} \doteq 13 \text{ months}.$$

$$\text{When I spend 5 groups, } 13\text{months}/5 \text{ groups} \doteq 3 \text{ months}.$$

③ Term of Track Bed

It is not assumed that the asphalt pavement undertakes construction parallel to track bed construction than the part which a roadbed finished with the object of a thought, the term of works.

Therefore, the term of works of the roadbed is 6 months.

(8) New track work

1) Laying Extension

- ① Between Muara Enim and Lahat $L=38.066\text{km}$.
- ② Between Prabumulih X6 and Kertapati $L=2.804+77.807=80.611\text{ km}$.
- ③ Total laying extension $L=38.066+80.611=118.677\text{km}$.

2) Term of Work

Work is set to 20th per 1km. (50m / group per day)

The work days: $N=118.677\text{km}\times 20\text{ days per km} \doteq 2374\text{ days}$.

$2374\text{ days} / 30\text{ days}=79\text{ months}$.

The work spends 9 groups and as a work condition, I assume it parallel work for roadbed construction and around three months.

$$8.8 - 3.0 \doteq \mathbf{6.0\text{ months}}$$

3.6.2. Double Tracking (1) (Section B), the 2nd Stage

(1) Target Extension

The environmental group setting that the construction extension which PT.KAI enforces it alone is 70.58km a double track.

This work delays, and the doubtful situation includes the completion by the project enforcement concerned.

Therefore, I shall maintain the construction of non-enforcement section by the project concerned, and the maintenance extension intends for approximately 30km based on a field work result.

(2) Term of Works

As for the extension of the double tracking the (2) (Section B) is approximately a one-third 30km a double track for the double tracking the (2) (Section A) and extension $L=27.54+80.6=108.14\text{km}$ of the double tracking (2) (Section C).

Therefore, you should secure the term of works appropriate to the extension ratio basically.

A tall and stout bridge of bridge long 40-50m is that a 2 bridge exists in this section, and the critical path of the 1 work (Section B) is decided a double track in total 24 months for 18 months and track laying work three months for preparations work three months and the term of works of the bridge concerned.

In addition, the details schedule of work itemization includes in reference to the work process of the double tracking the (2) (Section A) and the double tracking the (2) (Section C) appropriately.

3.7. Installation of Additional Crossing

Because it cannot become the critical path, I find the term of works for around six months with the appearance that kept room in the work latter half.

3.8. Improvement and New Installation of Signal and Telecom Equipment

Because it cannot become the critical path as well as the above, I find the term of works for around 12 months with the appearance that kept room in the work latter half.

3.9. Improvement and New Installation of Electromechanical Equipment

Similarly, I find the term of works for around 12 months with the appearance that gave you room in the work latter half because it cannot become the critical path.

3.10. Reinforcement of Rolling Stock Repair Facility

Similarly, I find term of works of the degree with the appearance that gave you room in the construction latter half for 12-15 months because it cannot become the critical path.

3.11. Reinforcement of Loading and Unloading Equipment

Similarly, because it cannot become the critical path, give enough me room at the first, the second stage and find term of works and find 15 months for true term of works in the latter half at the third stage.

3.12. Rolling Stock Procurement (Locomotives and Wagons)

According to the past example and the maker hearing, 2-3 years are usually required. Therefore, I secure term of works appropriate to the procurement amount of each stage in the form that planned adjustment with the whole term of works during the period concerned.

3.13. The Site Acquisition and Inhabitants Move

We carry out environmental assessment (AMDAL) for one year from enforcement six years ago for the third stage to plan facilitation of the construction and carry out the site acquisition and inhabitants move afterwards for five years.

4. Quantity of temporary work

4.1. Quantity of temporary work generalization list

(1) Temporary Earth Retaining Support

Type of work	Bridge pier			Abutment		
	One hit	Section A (unit)	Section C (unit)	One hit	Section A (unit)	Section C (unit)
Steel sheet pile number (sheets)	100	5	0	66	6	32
Steel sheet pile full length (m)	560	5	0	501.6	6	32
Steel sheet pile weight (t)	33.6	5	0	30.1	6	32
Strut number (n)	4	5	0	2	6	32
Strut weight (t)	3.72	5	0	1.30	6	32
Waling weight (t)	3.72	5	0	2.60	6	32
Type of work	Subtotal		Total			
	Section A	Section C				
Steel sheet pile number (sheets)	896	2112	3008			
Steel sheet pile full length (m)	5809.6	16051.2	21860.8			
Steel sheet pile weight (t)	348.6	963.2	1311.8			
Strut number (n)	32	64	96			
Strut weight (t)	26.40	41.60	68.00			
Waling weight (t)	34.20	83.20	117.40			

(2) Temporary piled pier

Type of work	Bridge length 160m			Bridge length 100m		
	One hit	Section A (unit)	Section C (unit)	One hit	Section A (unit)	Section C (unit)
Area (m ²)	1600	1	0	1000	1	0
Decking sheet	800	1	0	500	1	0
Main girder weight (t)	165.1	1	0	103.2	1	0
Beam seat weight (t)	56.8	1	0	36.1	1	0
Bearing pile weight (t)	184.1	1	0	117.2	1	0

Type of work	Bridge length 40m			Bridge length 15m		
	One hit	Section A (unit)	Section C (unit)	One hit	Section A (unit)	Section C (unit)
Area (m ²)	400	1	1	150	0	15
Decking sheet	200	1	1	75	0	15
Maingirder weight (t)	41.3	1	1	15.5	0	15
Beam seat weight (t)	15.5	1	1	6.9	0	15
Bearing pile weight (t)	50.2	1	1	22.3	0	15
Type of work	Subtotal		Total			
	Section A	Section C				
Area (m ²)	3000	2650	5650			
Decking sheet	1500	1325	2825			
Maingirder weight (t)	309.6	273.8	583.4			
Beam seat weight (t)	108.4	119.0	227.4			
Bearing pile weight (t)	351.5	384.7	736.2			

Amount of temporary between Prabumulih and Kertapati

Temporary earth retaining support for abutment work

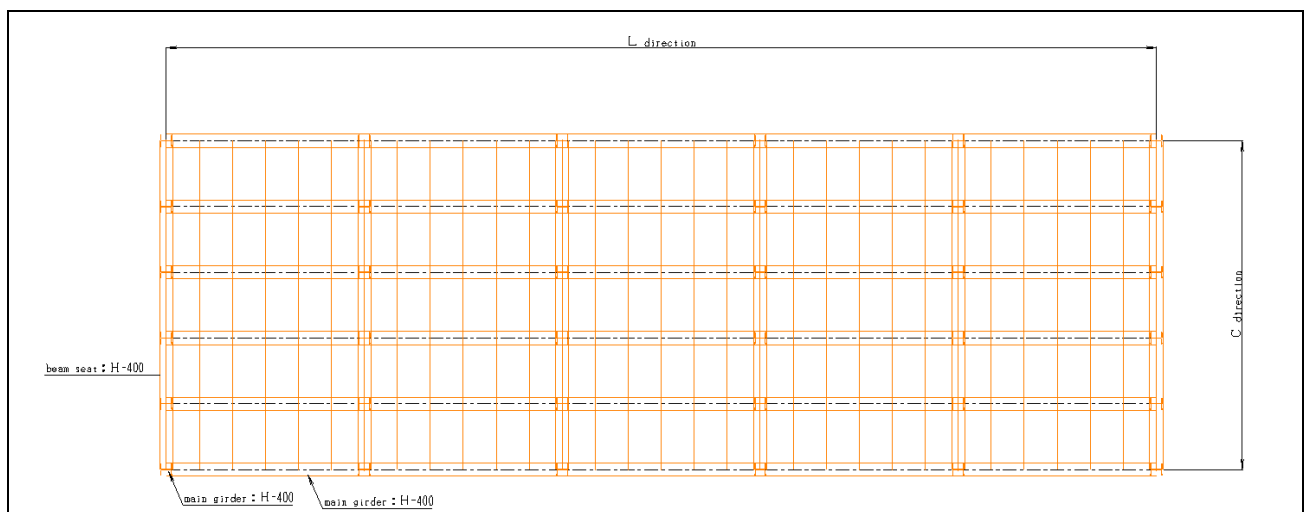
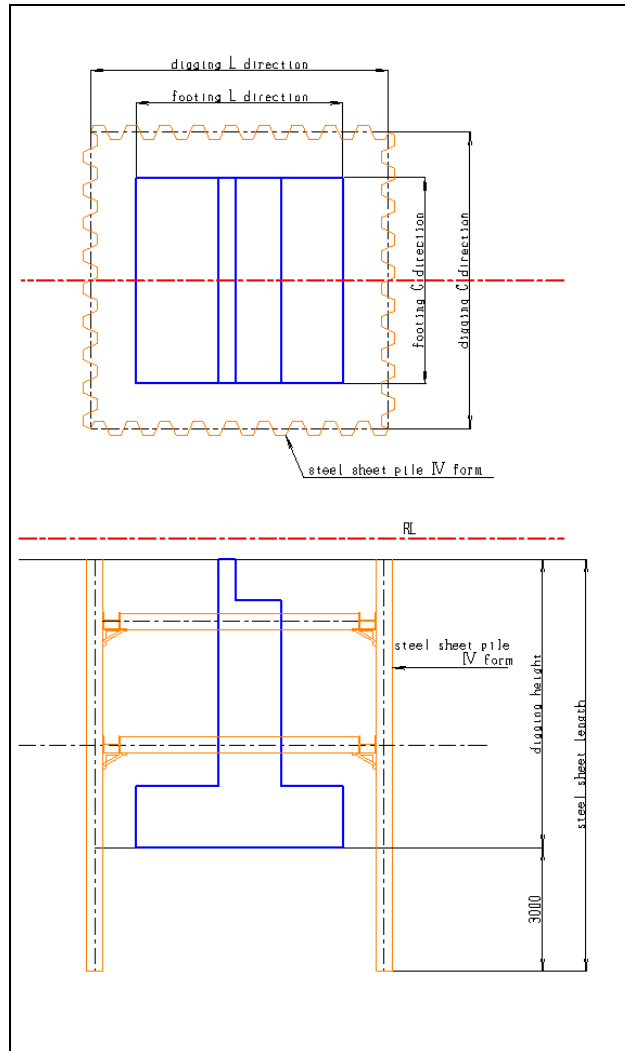
		Footing			Excavation		
		Direction L m	Direction C m	Area m ²	Direction L m	Direction C m	Area m ²
Bridge pier	Truss bridge	8.000	8.000	64.000	10.000	10.000	100.000
	Plate girder	5.000	5.000	25.000	7.000	7.000	49.000
		Dogging amount m	Steel sheet pile length m	Steel sheet pile extension (IVform) m	Support weight (H-300) t	Excavation volume m ³	
Abutment	Truss bridge	7.000	10.000	1000	14.2848	700	
	Plate girder	7.000	10.000	700	7.3656	343	
One hit							

Temporary piled pier for erection girder of truss bridge

		Temporary piled pier			Pile length m
		Direction L m	Direction C m	Area m ²	
	Truss bridge	30.000	10.000	300.000	15.000
		Decking area	Decking sheet	H-steel weight (H-400) t	H-steel weight (H-400) t
	Truss bridge	300.00	150	41.28	92.88
One hit					

4.2. Unit quantity

(1) Common Dimensional Drawing



(2) Quantity of Temporary Earth Retaining Support

1) Calculation Condition

- ① The amount between Muaraenim - PbrX6 where it is carried out becoming it removes a double track now.
- ② I do the dimensions of substructure and the digging with a value same as quantity of bridge substructure • superstructure.
- ③ The wall of the temporary earth-retaining support assumes it steel sheet pile type III and does it with a root case by length same as the amount of digging.
- ④ The temporary sand guards mechanic assumes it strut type (one step) and I raise a stomach and do strut together with H-300.

The strut interval assumes it around 3.0m.

Bridge pier	:	Plane shape	B×L	(m)	=	9.0	×	9.0
		Height	H	(m)	=	1.8		
		Overburden	h	(m)	=	1.0		
		Basic height	h'	(m)	=	1.5		
		Overbreak	b	(m)	=	0.5		
		Leveling concrete	c	(m)	=	0.3		
Abutment	:	Plane shape	B×L	(m)	=	6.0	×	6.0
		Height	H	(m)	=	1.5		
		Overburden	h	(m)	=	2.0		
		Basic height	h'	(m)	=	1.5		
		Overbreak	b	(m)	=	0.5		
		Leveling concrete	c	(m)	=	0.3		

2) Amount Calculation of Temporary Earth Retaining Support (One bridge pier hit)

- ① steel sheet pile number $n1 = (9.0+9.0+0.5 \times 4.0) \times 2 / 0.4 = 100$ (sheets)
- ② steel sheet pile full length $L1 = (1.0+1.5+0.3) \times 2 \times n = 560$ (m)
- ③ steel sheet pile weight $= 0.060 \times 560 = 33.6$ (t)
- ④ strut number $n2 = (10.0 / 3.0 - 1) + (10.0 / 3.00 - 1) \doteq 4$ (n)
- ⑤ strut weight $= (10.0 \times 4) \times 0.093 = 3.72$ (t)
- ⑥ waling weight $= (10.0 + 10.0) \times 2 \times 0.093 = 3.72$ (t)

3) Amount Calculation of Temporary Earth Retaining Support (One abutment hit)

① Steel sheet pile number	$n1 = (6.0+6.0+0.3 \times 4.0) \times 2 / 0.4$	=	66 (sheets)
② Steel sheet pile full length	$L1 = (2.0+1.5+0.3) \times 2 \times n$	=	501.6 (m)
③ Steel sheet pile weight	$= 0.060 \times 501.6$	=	30.1 (t)
④ Strut number	$n2 = (7.0 / 3.0 - 1) + (7.0 / 3.0 - 1)$	\doteq	2 (n)
⑤ Strut weight	$= (7.0 \times 2) \times 0.093$	=	1.30 (t)
⑥ Waling weight	$= (7.0 + 7.0) \times 2 \times 0.093$	=	2.60 (t)

(3) Quantity of Temporary Piled Pier

1) Calculation Condition

- ① The amount between Muaraenim - PbrX6 where it is carried out becoming it removes a double track now.
- ② As for the plane dimensions, the track direction assumes length of bridge and the equivalent, Track crossing direction 10m.
- ③ The main girder distance receives 2.0m and does the figure (bearing pile) distance with 5.0m and the main girder and the material of the beam seat both adopt H-300.
- ④ The length of the bearing pile is assumed 10m, and assumed to be H-300.
- ⑤ The length of bridge assumes it four types of total of 160m (1 bridge) of the truss bridge, 100m (1 bridge), 40m (1 bridge) and 15m (the mean head of the 15 bridge) of the plate girder bridge.

160m	Plane shape	B×L	(m)	=	160.0	×	10.0
	Bearing pile length	H	(m)	=	10.0		
100m	Plane shape	B×L	(m)	=	100.0	×	10.0
	Bearing pile length	H	(m)	=	10.0		
40m	Plane shape	B×L	(m)	=	40.0	×	10.0
	Bearing pile length	H	(m)	=	10.0		
15m	Plane shape	B×L	(m)	=	15.0	×	10.0
	Bearing pile length	H	(m)	=	10.0		

2) Amount Calculation of Temporary Piled Pier (1 bridge (160m) hit)

① Temporary piled pier area	$= 160.0 \times 10.0$	=	1600 (m ²)
② Deck sheets	$= 1600.0 / 2.0$	=	800.0 (sheets)
③ Main girder weight	$= (10.0 / 2.0 + 1) \times 160.0 \times 0.172$	=	165.1 (t)
④ Beam seat weight	$= (160.0 / 5.0 + 1) \times 10.0 \times 0.172$	=	56.8 (t)
⑤ Bearing pile weight	$= (10.0 / 2.0 + 1) \times (160.0 / 5.0 + 1) \times 10.0 \times 0.093$ $= 184.1 (t)$		

3) Amount calculation of temporary piled pier (1 bridge (100m) hit)

① Temporary piled pier area	$= 100.0 \times 10.0$	=	1000 (m ²)
② Deck sheets	$= 1000.0 / 2.0$	=	500.0 (sheets)

③Main girder weight	= (10.0/2.0+1) ×100.0×0.172	=	103.2 (t)
④Beam seat weight	= (100.0/5.0+1) ×10.0×0.172	=	36.1 (t)
⑤Bearing pile weight	= (10.0/2.0+1) × (100.0/5.0+1) ×10.0×0.093		
	=117.2 (t)		

4) Amount Calculation of Temporary Piled Pier (1 bridge (40m) hit)

①Temporary piled pier area	=40.0×10	=	400.0 (m ²)
②Deck sheets	=400.0/2.0	=	200.0 (sheets)
③Main girder weight	= (10.0/2.0+1) ×40.0×0.172	=	41.3 (t)
④Beam seat weight	= (40.0/5.0+1) ×10.0×0.172	=	15.5 (t)
⑤Bearing pile weight	= (10.0/2.0+1) × (40.0/5.0+1) ×10.0×0.093		
	= 50.2 (t)		

5) Amount Calculation of Temporary Piled Pier (1 bridge (15m) hit)

①Temporary piled pier area	=15.0×10	=	150.0 (m ²)
②Deck sheets	=150.0/2.0	=	75.0 (sheets)
③Main girder weight	= (10.0/2.0+1) ×15.0×0.172	=	15.5 (t)
④Beam seat weight	= (15.0/5.0+1) ×10.0×0.172	=	6.9 (t)
⑤Bearing pile weight	= (10.0/2.0+1) × (15.0/5.0+1) ×10.0×0.093		
	= 22.3 (t)		

[Appendix 5-4-1] Civil Works

1. Civil works Cost summary table - 1

The first stage(Single track improvement,Target transportation amount 2.5 million ton/year,395m in train organization length)

The second stage(Target transportation amount five million ton/year,61.5m in train organization length)

The third stage (Complete double-track line making,930m in train organization length during target transportation amount 20 million ton/year)

№	Work item	Unit	The first stage		The second stage		The third stage		Recapitulation
			Quantity	Construction expense(Rp)	Quantity	Construction expense(Rp)	Quantity	Construction expense(Rp)	
	①Improvement work cost of existing roadbed								
	1. Existing sub ballast improvement	m ³	78,711	48,053,065,500	78,711	48,053,065,500	78,711	48,053,065,500	Reinforced roadbed
	①Accumulation total			48,053,065,500		48,053,065,500		48,053,065,500	
	①The increase total					0		0	
	②Improvement work cost of civil engineering structures								
	1.EARTH WORKS (Lahat~Muaraenim,PhrX6~Kertapati)								
	1.1. Existing station improvement(L>930m)								
	1.1.1. Land preparation	m ²	3,396	52,169,352	14,418	221,489,316	34,386	528,237,732	
	1.1.2. New sub ballast								
	(1) Fill section	m ³	542	330,891,000	2,892	1,765,566,000	5,599	3,418,189,500	Reinforced roadbed
	(2) Cut section	m ³	308	188,034,000	1,026	626,373,000	5,824	3,555,552,000	Reinforced roadbed
	1.1.3. Fill worker	m ³	2,438	432,208,640	12,182	2,159,624,960	20,564	3,645,585,920	Purchase soil use
	1.1.4. Pile net worker(Between Pyk-Kpt.)	m ²	0	0	0	0	2,934	4,289,989,176	Soft ground measures
	1.1.5. Cut worker	m ³	1,207	298,732,500	9,393	2,324,767,500	43,655	10,804,612,500	
	1.1.6. Vegetation worker								
	(1) Fill section	m ²	898	59,268,000	4,518	298,188,000	7,882	520,212,000	
	(2) Cut section	m ²	361	23,826,000	2,830	186,780,000	13,095	864,270,000	
	1.2.New station (L=1,000m)								
	1.2.1.Land preparation	m ²		15,362	0	129,040,800	12,000	184,344,000	
	1.2.2.New sub ballast								
	(1) Fill section	m ³		610,500	0	1,410,255,000	3,570	2,179,485,000	Reinforced roadbed
	(2) Cut section	m ³		610,500	0	183,150,000	570	347,985,000	Reinforced roadbed
	1.2.3.Fill worker	m ³		177,280	0	2,270,956,800	17,310	3,068,716,800	Purchase soil use
	1.2.4.Pile net worker (Between Pyk~Kpt)	m ²		1,462,164	0	6,141,088,800	6,000	8,772,984,000	Soft ground measures
	1.2.5.Cut worker	m ³		247,500	0	853,875,000	3,450	853,875,000	
	1.2.6.Vegetation worker								
	(1) Fill section	m ²		66,000	0	299,706,000	6,283	414,678,000	
	(2) Cut section	m ²		66,000	0	68,508,000	1,038	68,508,000	
	2.DRAIN WORKER (Lahat~Muaraenim,PhrX6~Kertapati)								
	2.1.Existing station improvement (L>930m)								
	2.1.1.U type side ditch (direction of railway track)								
	(1) Fill section	m	258	152,610,096	1,377	814,512,024	2,666	1,576,970,992	
	(2) Cut section	m	308	182,185,696	1,026	606,891,312	3,065	1,812,984,280	
	2.1.2.Catchment								
	(1) Fill section	no	5	20,625,000	28	115,500,000	44	181,500,000	
	(2) Cut section	no	6	24,750,000	20	82,500,000	42	173,250,000	

No	Work item	Unit	Unit price (Rp)	The first stage		The second stage		The third stage		Recapitulation
				Quantity	Construction expense (Rp)	Quantity	Construction expense (Rp)	Quantity	Construction expense (Rp)	
	2.1.3. Crossing drain (Increase length L=6.0m/no)									
	(1) Concrete pipe	no	17,488,692		0	6	104,932,152	8	139,909,536	with the Hume pipe
	(2) Box culvert, U type	no	2,622,431,256		0	4	10,489,725,024	9	23,601,881,304	Box <2m
	2.2. New station (L=1,000m)									
	2.2.1. U type side ditch (direction of railway track)									
	(1) Fill section	m	591,512		0	1,100	650,663,200	1,700	1,005,570,400	
	(2) Cut section	m	591,512		0	300	177,453,600	300	177,453,600	
	2.2.2. Catchment									
	(1) Fill section	no	4,125,000		0	22	90,750,000	34	140,250,000	
	(2) Cut section	no	4,125,000		0	6	24,750,000	6	24,750,000	
	2.2.3. Crossing drain (Increase length L=6.0m/no)									
	(1) Concrete pipe	no	17,488,692		0	1	17,488,692	2	34,977,384	with the Hume pipe
	(2) Box culvert, U type	no	2,622,431,256		0	2	5,244,862,512	3	7,867,293,768	Box <2m
	②Accumulation total				1,765,300,284		37,359,397,692		80,254,015,892	
	②The increase total						# 35,594,097,408		# 42,894,618,200	
	③Construction cost of new line between Merapi and coal storage yard									
	1.EARTH WORKS (Lahat~Muaraenim,PbrX6~Kertapati)									
	1.1. New line construction (Merapi~Coal yard L=700m)									
	1.1.1. Land preparation	m ²	15,362		0	21,140	324,752,680	21,140	324,752,680	Purchase soil use
	1.1.2. New sub ballast	m ³	610,500		0	6,030	3,681,315,000	6,030	3,681,315,000	Reinforced roadbed
	1.1.3. Fill worker	m ³	177,280		0	12,410	2,200,044,800	12,410	2,200,044,800	Purchase soil use
	1.1.4. Pile net worker (Between Pyk~Kpt)	m ²	1,462,164		0	0	0	0	0	Soft ground measures
	1.1.5. Vegetation worker	m ²	66,000		0	6,490	428,340,000	6,490	428,340,000	
	2.DRAIN WORKER (Lahat~Muaraenim,PbrX6~Kertapati)									
	2.1. New line construction (Merapi~Coal yard L=700m)									
	2.1.1. U type side ditch (direction of railway track)	m	591,512		0	3,600	2,129,443,200	3,600	2,129,443,200	
	2.1.2. Catchment	no	4,125,000		0	72	297,000,000	72	297,000,000	
	2.1.3. Crossing drain	m	2,914,782		0	531	1,547,749,242	531	1,547,749,242	with the Hume pipe
	③Accumulation total				0		10,608,644,922		10,608,644,922	
	③The increase total						# 10,608,644,922		0	
	④Double tracking work (1) cost									
	1. Construction of making to double-track line section (Muaraenim~PbrX6)EARTHWORK COST	km	8,860,313,329		0	28	249,860,835,878	28	249,860,835,878	Refer to the next page.
	④Accumulation total				0		249,860,835,878		249,860,835,878	
	④The increase total						# 249,860,835,878		0	
	⑤Double tracking work (2) and (3) cost									
	1.EARTH WORKS (Lahat~Muaraenim,PbrX6~Kertapati)									
	1.1. Double track line construction (L1~Me.,PbrX6~Kpt)									
	1.1.1. Levelling the land	m ²	15,362		0		0	713,388	10,959,066,456	
	1.1.2. New sub ballast	m ³	610,500		0		0	131,036	79,997,478,000	Reinforced roadbed
	(2) Cut section	m ³	610,500		0		0	107,350	65,537,175,000	Reinforced roadbed
	1.1.3. Fill worker	m ³	177,280		0		0	543,963	96,433,760,640	Purchase soil use

No	Work item	Unit	Unit price (Rp)	The first stage		The second stage		The third stage		Recapitulation
				Quantity	Construction expense (Rp)	Quantity	Construction expense (Rp)	Quantity	Construction expense (Rp)	
	1.1.4.Pile net worker (Between Pyk~Kpt)	m ²	1,462,164	0	0	0	0	131,814	192,733,685,496	Soft ground measures
	1.1.5.Cut worker	m ³	247,500		0		0	630,910	156,150,225,000	
	1.1.6.Vegetation worker									
	(1) Fill section	m ²	66,000		0		0	202,481	13,363,746,000	
	(2) Cut section	m ²	66,000		0		0	189,454	12,503,964,000	
	2.BRIDGE WORKS (Lahar~Muaraenim,PbrX6~Kertapati)									
	2.1.Superstructure worker									
	2.1.1.Steel girder (Truss)	t	99,000,000		0		0	847	83,827,854,000	Foreign currency
	2.1.2.Steel girder (1 beam,Plate girder)	t	71,500,000		0		0	269	19,265,317,500	Foreign currency
	2.1.3.RC girder	m ³	2,159,777		0		0	13	28,077,101	
	2.1.4.H burial girder	m ³	6,600,000		0		0	31	204,600,000	
	2.1.5.Bearing and installation	no	2,788,033		0		0	108	301,107,564	
	2.2.Substructure worker									
	2.2.1.Pier • Abutment	m ³	1,943,115		0		0	10,807	20,999,243,805	
	2.2.2.Basic construction test digging	m ³	690,695		0		0	9,734	6,723,225,130	
	2.3.Temporary housing construction (road and pier for construction)	set	75,394,000,000		0		0	1	75,394,000,000	
	3.DRAIN WORKER (Lahar~Muaraenim,PbrX6~Kertapati)									
	3.1.Double track line construction (Lr~Me,PbrX6~Kpt)									
	3.1.1.U type side ditch (direction of railway track)									
	(1) Fill section	m	591,512		0		0	62,395	36,907,391,240	
	(2) Cut section	m	591,512		0		0	56,500	33,420,428,000	
	3.1.2.Catchment									
	(1) Fill section	no	4,125,000		0		0	1,248	5,148,000,000	
	(2) Cut section	no	4,125,000		0		0	1,130	4,661,250,000	
	3.1.3.Crossing drain (Increase length L=6.0m/no)									
	(1) Concrete pipe	no	17,488,692		0		0	128	2,238,552,576	with the Hume pipe
	(2) Box culvert,U type	no	2,622,431,256		0		0	80	209,794,500,480	Box < 2m
	⑤Accumulation total				0		0		1,126,592,647,988	
	⑤The increase total								# 1,126,592,647,988	
	⑥Installation work cost of additional crossing									
	1.RAILROAD CROSSING (Lr~Me,PbrX6~Kpt)									
	1.1.Existing station improvement (L>930m)									
	1.1.1.Railroad crossing	no	300,000,000		0	9	2,700,000,000	13	3,900,000,000	1no/st.(assumption)
	1.2.Double track line construction									
	1.2.1.Railroad crossing	no	300,000,000		0		0	39	11,700,000,000	3no/st.(assumption)
	⑥Accumulation total				0		2,700,000,000		15,600,000,000	
	⑥The increase total						# 2,700,000,000		# 12,900,000,000	
	Accumulation construction expense total	Rp			49,818,365,784		348,581,943,992		1,530,969,210,180	
	The increase construction expense total	Rp					# 298,763,578,208		# 1,182,387,266,188	
		100 million yen			4.5		31.7		139.2	1 yen = 110RP

2. Civil works Cost summary table - 2

Whole line double-track line making(Only making Lahat-Muaraenim and PbrX6-Kertapati a double-track line)

:For the construction of making to double-track line expense calculation between Muaraenim-PbrX6

1/3

No	Work Item	Unit	Unit price Rp	Quantity	Construction expense(Rp)	Recapitulation
	1.EARTH WORKS (Lahat~Muaraenim,PbrX6~Kertapati)					
	1.1.Existing sub ballast improvement	m ³	610,500	0	0	Reinforced road
	1.2.Land preparation					
	1 industrial sector:L~Me	m ²	15,362	234,876	3,608,165,112	
	2 industrial sectors:X6~Pyk	m ²	15,362	325,098	4,994,155,476	
	3 industrial sectors:Pyk~Kpt	m ²	15,362	153,414	2,356,745,868	
	Total			713,388		
	1.3.New sub ballast					
	1.3.1.Fill section					
	1 industrial sector:L~Me	m ³	610,500	42,412	25,892,526,000	Reinforced road
	2 industrial sectors:X6~Pyk	m ³	610,500	42,489	25,939,534,500	Reinforced road
	3 industrial sectors:Pyk~Kpt	m ³	610,500	46,135	28,165,417,500	Reinforced road
	Total			131,036		
	1.3.2.Cut section					
	1 industrial sector:L~Me	m ³	610,500	36,005	21,981,052,500	Reinforced road
	2 industrial sectors:X6~Pyk	m ³	610,500	64,505	39,380,302,500	Reinforced road
	3 industrial sectors:Pyk~Kpt	m ³	610,500	6,840	4,175,820,000	Reinforced road
	Total			107,350		
	1.4.Fill worker					
	1 industrial sector:L~Me	m ³	177,280	229,657	40,713,592,960	Purchase soil use
	2 industrial sectors:X6~Pyk	m ³	177,280	149,037	26,421,279,360	Purchase soil use
	3 industrial sectors:Pyk~Kpt	m ³	177,280	165,269	29,298,888,320	Purchase soil use
	Total			543,963		
	1.5.Pile net worker (Between Pyk~Kpt)					
	1 industrial sector:L~Me	m ²	1,462,164	0	0	Soft ground measures
	2 industrial sectors:X6~Pyk	m ²	1,462,164	0	0	Soft ground measures
	3 industrial sectors:Pyk~Kpt	m ²	1,462,164	131,814	192,733,685,496	Soft ground measures
	Total			131,814		
	1.6.Cut worker					
	1 industrial sector:L~Me	m ³	247,500	266,285	65,905,537,500	
	2 industrial sectors:X6~Pyk	m ³	247,500	321,065	79,463,587,500	
	3 industrial sectors:Pyk~Kpt	m ³	247,500	43,560	10,781,100,000	
	Total			630,910		
	1.7.Vegetation worker					
	1.7.1.Fill section					
	1 industrial sector:L~Me	m ²	66,000	65,536	4,325,376,000	
	2 industrial sectors:X6~Pyk	m ²	66,000	65,656	4,333,296,000	
	3 industrial sectors:Pyk~Kpt	m ²	66,000	71,289	4,705,074,000	
	Total			202,481		
	1.7.2.Cut section					
	1 industrial sector:L~Me	m ²	66,000	63,542	4,193,772,000	
	2 industrial sectors:X6~Pyk	m ²	66,000	113,840	7,513,440,000	
	3 industrial sectors:Pyk~Kpt	m ²	66,000	12,072	796,752,000	
	Total			189,454		

No	Work item	Unit	Unit price Rp	Quantity	Construction expense (Rp)	Recapitulation
	2. BRIDGE WORKS (Lahar~Muaraninim, PbrX6~Kertapati)					
	2.1. Superstructure worker					
	2.1.1. Steel girder (Truss)					
	1 industrial sector: L~Me	t	99,000,000	711	70,398,504,000	Foreign currency
	2 industrial sectors: X6~Pyk	t	99,000,000	0	0	Foreign currency
	3 industrial sectors: Pyk~Kpt	t	99,000,000	136	13,429,350,000	Foreign currency
	Total			847		
	2.1.2. Steel girder (1 beam. Plate girder)					
	1 industrial sector: L~Me	t	71,500,000	0	0	Foreign currency
	2 industrial sectors: X6~Pyk	t	71,500,000	19	1,338,623,000	Foreign currency
	3 industrial sectors: Pyk~Kpt	t	71,500,000	251	17,926,694,500	Foreign currency
	Total			269		
	2.1.3. RC girder					
	1 industrial sector: L~Me	m ³	2,159,777	13	28,077,101	
	2 industrial sectors: X6~Pyk	m ³	2,159,777	0	0	
	3 industrial sectors: Pyk~Kpt	m ³	2,159,777	0	0	
	Total			13		
	2.1.4. H burial girder					
	1 industrial sector: L~Me	m ³	6,600,000	31	204,600,000	
	2 industrial sectors: X6~Pyk	m ³	6,600,000	0	0	
	3 industrial sectors: Pyk~Kpt	m ³	6,600,000	0	0	
	Total			31		
	2.1.5. Bearing and installation					
	1 industrial sector: L~Me	no	2,788,033	44	122,673,452	
	2 industrial sectors: X6~Pyk	no	2,788,033	4	11,152,132	
	3 industrial sectors: Pyk~Kpt	no	2,788,033	60	167,281,980	
	Total			108		
	2.2. Substructure worker					
	2.2.1. Pier • Abutment					
	1 industrial sector: L~Me	m ³	1,943,115	6,077	11,808,309,855	
	2 industrial sectors: X6~Pyk	m ³	1,943,115	288	559,617,120	
	3 industrial sectors: Pyk~Kpt	m ³	1,943,115	4,442	8,631,316,830	
	Total			10,807		
	2.2.2. Basic construction test digging					
	1 industrial sector: L~Me	m ³	690,695	3,782	2,612,208,490	
	2 industrial sectors: X6~Pyk	m ³	690,695	372	256,938,540	
	3 industrial sectors: Pyk~Kpt	m ³	690,695	5,580	3,854,078,100	
	Total			9,734		
	3. DRAIN WORKER (Lahar~Muaraninim, PbrX6~Kertapati)					
	3.1. U type side ditch (direction of railway track)					
	3.1.1. Fill section					
	1 industrial sector: L~Me	m	591,512	20,196	11,946,176,352	
	2 industrial sectors: X6~Pyk	m	591,512	20,233	11,968,062,296	
	3 industrial sectors: Pyk~Kpt	m	591,512	21,969	12,994,927,128	
	Total			62,398		

No	Work item	Unit	Unit price Rp	Quantity	Construction expense (Rp)	Recapitulation
	3.1.2.Cut section					
	1 industrial sectors:Lr~Me	m	591,512	18,950	11,209,152,400	
	2 industrial sectors:X6~Pyk	m	591,512	33,950	20,081,832,400	
	3 industrial sectors:Pyk~Kpt	m	591,512	3,600	2,129,443,200	
	Total			56,500		
	3.2.Catchment					
	3.2.1.Fill section					
	1 industrial sector:Lr~Me	no	4,125,000	404	1,666,500,000	
	2 industrial sectors:X6~Pyk	no	4,125,000	405	1,670,625,000	
	3 industrial sectors:Pyk~Kpt	no	4,125,000	439	1,810,875,000	
	Total			1,248		
	3.2.2.Cut section					
	1 industrial sector:Lr~Me	no	4,125,000	379	1,563,375,000	
	2 industrial sectors:X6~Pyk	no	4,125,000	679	2,800,875,000	
	3 industrial sectors:Pyk~Kpt	no	4,125,000	72	297,000,000	
	Total			1,130		
	3.3.Crossing drain (Increase length L=6.0m/no)					
	3.3.1.Concrete pipe					
	1 industrial sector:Lr~Me	no	17,488,692	96	1,678,914,432	with the Hume pipe
	2 industrial sectors:X6~Pyk	no	17,488,692	25	437,217,300	with the Hume pipe
	3 industrial sectors:Pyk~Kpt	no	17,488,692	7	122,420,844	with the Hume pipe
	Total			128		
	3.3.2.Box culvert, U type					
	1 industrial sector:Lr~Me	no	2,622,431,256	35	91,785,093,960	Box<2m
	2 industrial sectors:X6~Pyk	no	2,622,431,256	38	99,652,387,728	Box<2m
	3 industrial sectors:Pyk~Kpt	no	2,622,431,256	7	18,557,018,792	Box<2m
	Total			80		
	4.RAILROAD CROSSING (Lr~Me;PbrX6~Kpt)					
	4.1.Railroad crossing					
	1 industrial sector:Lr~Me	m ²	369,494	432	159,621,408	6m×6m×39no
	2 industrial sectors:X6~Pyk	m ²	369,494	756	279,337,464	12no
	3 industrial sectors:Pyk~Kpt	m ²	369,494	216	79,810,704	21no
	Total			1,404		6no
	Construction Total Cost	Rp	100 million yen		1,051,719,192,100	95.6 1.yen = 110RP

3. Civil works Cost summary table - 3

④ idea: The coal unloading equipment is constructed in Musi river away from Simpang at about 7km.

⑤ idea: The coal unloading equipment is constructed in Mariana away from Simpang at about 35km.

⑥ idea: The coal unloading equipment is constructed in Gasing away from Simpang at about 45km.

№	Work item	Unit	Unit price (Rp)	④ idea		⑤ idea		⑥ idea		Recapitulation
				Quantity	Construction expense(Rp)	Quantity	Construction expense(Rp)	Quantity	Construction expense(Rp)	
	1.EARTH WORKS (Simpang ~ Gaing)									
	1.1.New sub ballast	m ³	610,500	20,478	12,501,819,000	99,402	60,684,921,000	95,072	58,041,456,000	Reinforced roadbed
	1.2.Leveling the land	m ²	15,362	90,008	1,382,702,896	436,812	6,710,305,944	417,842	6,418,888,804	
	1.3.Fill worker	m ³	177,280	117,778	20,879,683,840	567,582	100,620,936,960	545,372	96,683,548,160	Purchase soil use
	1.4.Pile net worker (Between Pyk ~ Kpt)	m ²	1,462,164	90,008	131,606,457,312	436,812	638,690,781,168	417,842	610,953,530,088	Soft ground measures
	1.5.Vegetation worker	m ²	66,000	50,189	3,312,474,000	248,350	16,391,100,000	234,649	15,486,834,000	
	2.BRIDGE WORKS									
	2.1.Superstructure worker									
	2.1.1.Steel girder (60m Truss)	t	110,000,000		0	1,040	114,400,000,000	975	107,250,000,000	Foreign currency
	2.1.2.Steel girder (40m Truss)	t	99,000,000	90	8,910,000,000	360	35,640,000,000	360	35,640,000,000	Foreign currency
	2.2.Substructure worker									
	2.2.1.Pier • Abutment	m ³	1,943,115	408	792,790,920	3,714	7,216,729,110	4,296	8,347,622,040	
	2.2.2.Basic construction test digging	m ³	690,695	372	256,938,540	1,860	1,284,692,700	1,488	1,027,754,160	
	2.2.2.Steel pipe yaia idutsu base	m	5,500,000		0	2,640	14,520,000,000	3,168	17,424,000,000	
	3.GIRDER VIADUCT WORKS									
	3.1.Superstructure worker									
	3.1.1.Steel girder (Composite beam,I beam)	t	71,500,000		0		0	15,000	1,072,500,000,000	Foreign currency
	3.2.Substructure worker									
	3.2.1.Pier • Abutment	m ³	1,943,115		0		0	35,400	68,786,271,000	
	3.2.2.Basic construction test digging	m ³	690,695		0		0	32,400	22,378,518,000	
	3.2.3.Steel pipe yaia idutsu base	m	5,500,000		0		0	27,600	151,800,000,000	
	4.DRAIN WORKER									
	4.1.U type side ditch (direction of railway track)	m	591,512	13,920	8,233,847,040	68,880	40,743,346,560	65,080	38,495,600,960	
	4.2.Catchment	no	4,125,000	278	1,146,750,000	1,376	5,676,000,000	1,300	5,362,500,000	
	4.3.Crossing drain	m	2,914,782	1,798	5,240,778,036	8,728	25,440,217,296	8,349	24,335,514,918	with the Hume pipe
	Construction Total Cost	Rp			194,264,241,584		1,068,019,030,738		2,340,932,038,130	
		100 million yen			17.7		97.1		212.8	1 yen = 110RP

4. Civil works unit price table

No	Work item	Unit	Unit price (Rp)	Recapitulation
1.0	CIVIL WORKS			
1.1	Land preparation	m ²	15,362	
1.2	Cut worker	m ³	247,500	
1.3	Fill worker (Excavated Material)	m ³	101,424	
1.4	Fill worker (Borrow Material)	m ³	177,280	
1.5	Vegetation worker	m ²	66,000	
1.6	(Track Bed Worker	m ³	610,500	Reinforced roadbed
1.7	Pile net worker	m ²	1,462,164	
1.10	Temporary Soil Detainment	m ³	690,695	
1.11	RAILROAD CROSSING	no	300,000,000	
2.0	BRIDGE WORKS • Superstructure worker			
2.1	Structural Concrete, for Abutments & Pier	m ³	1,943,115	
2.2	Steel pipe	m	5,500,000	
3.0	BRIDGE WORKS • Substructure worker			
3.1	Truss Girder (Crane construction)	ton	99,000,000	Foreign currency
3.2	Truss Girder (Girder construction)		110,000,000	Foreign currency
3.3	Plate Girder	ton	71,500,000	Foreign currency
3.4	Single T Girder	m ³	2,159,777	
3.5	Slab Girder	m ³	1,963,434	
3.6	CHS Girder (H Burial)	m ³	6,600,000	
3.7	Prestress Concrete for Deck Girder	m ³	10,589,000	
3.8	Prestress Concrete for Trough Girder	m ³	11,646,961	
3.9	Bearing and Installation	no	2,788,033	
4.0	DRAIN WORKER			
4.1	Box Culvert < 2m	m	437,071,876	
4.2	Box Culvert > 2m	m	713,959,135	
4.3	U type side ditch	m	2,914,782	
4.4	Concrete Open U - Ditch	m	591,512	
4.5	Catchmento	no	4,125,000	

5. Civil works Quantity summary table - 1

The first stage(Single track improvement,Target transportation amount 2.5 million ton/year,395m in train organization length)

The second stage (Target transportation amount five million ton/year,615m in train organization length)

The third stage (Complete double-track line making,930m in train organization length during target transportation amount 20 million ton/year)

№	Work item	Unit	The first stage	The second stage	The third stage	Recapitulation
			Quantity	Quantity	Quantity	
	①Improvement work cost of existing roadbed					
	1. Existing sub ballast improvement	m ³	78,711	78,711	78,711	Reinforced roadbed
	②Improvement work cost of civil engineering structures					
	1.CIVIL WORKS (Lahat~Muaraenim,PbrX6~Kertapati)					
	1.1. Existing station improvement(L>930m)					
	1.1.1. Land preparation	m ²	3,396	14,418	34,386	
	1.1.2. New sub ballast					
	(1) Fill section	m ³	542	2,892	5,599	Reinforced roadbed
	(2) Cut section	m ³	308	1,026	5,824	Reinforced roadbed
	1.1.3. Fill worker	m ³	2,438	12,182	20,564	Purchase soil use
	1.1.4. Pile net worker(Between Pyk-Kpt.)	m ²	0	0	2,934	Soft ground measures
	1.1.5. Cut worker	m ³	1,207	9,393	43,655	
	1.1.6. Vegetation worker					
	(1) Fill section	m ²	898	4,518	7,882	
	(2) Cut section	m ²	361	2,830	13,095	
	1.2.New station (L=1,000m)					
	1.2.1.Land preparation	m ²		8,400	12,000	
	1.2.2.New sub ballast					
	(1) Fill section	m ³		2,310	3,570	Reinforced roadbed
	(2) Cut section	m ³		300	570	Reinforced roadbed
	1.2.3.Fill worker	m ³		12,810	17,310	Purchase soil use
	1.2.4.Pile net worker (Btween Pyk~Kpt)	m ²		4,200	6,000	Soft ground measures
	1.2.5.Cut worker	m ³		3,450	3,450	
	1.2.6.Vegetation worker					
	(1) Fill section	m ²		4,541	6,283	
	(2) Cut section	m ²		1,038	1,038	
	2.DRAIN WORKER (Lahat~Muaraenim,PbrX6~Kertapati)					
	2.1.Existing station improvement (L>930m)					
	2.1.1.U type side ditch (direction of railway track)					
	(1) Fill section	m	258	1,377	2,666	
	(2) Cut section	m	308	1,026	3,065	
	2.1.2.Catchmento					
	(1) Fill section	no	5	28	44	
	(2) Cut section	no	6	20	42	
	2.1.3.Crossing drain (Increase length L=6.0m/no)					
	(1) Concrete pipe	no		6	8	with the Hume pipe
	(2) Box culvert,U type	no		4	9	Box < 2m
	2.2.New station (L=1,000m)					
	2.2.1.U type side ditch (direction of railway track)					
	(1) Fill section	m		1,100	1,700	
	(2) Cut section	m		300	300	
	2.2.2.Catchmento					
	(1) Fill section	no		22	34	
	(2) Cut section	no		6	6	
	2.2.3.Crossing drain (Increase length L=6.0m/no)					
	(1) Concrete pipe	no		1	2	with the Hume pipe
	(2) Box culvert,U type	no		2	3	Box < 2m
	③Construction cost of new line between Merapi and coal storage yard					
	1.CIVIL WORKS (Lahat~Muaraenim,PbrX6~Kertapati)					
	1.1.New line construction (Merapi~Coal yard L=700m)					
	1.1.1.Land preparation	m ²		21,140	21,140	Purchase soil use

№	Work item	Unit	The first stage	The second stage	The third stage	Recapitulation
			Quantity	Quantity	Quantity	
	1.1.2.New sub ballast	m ³		6,030	6,030	Reinforced roadbed
	1.1.3.Fill worker	m ³		12,410	12,410	Purchase soil use
	1.1.4.Pile net worker (Btween Pyk~Kpt)	m ²		0	0	Soft ground measures
	1.1.5.Vegetation worker	m ²		6,490	6,490	
	2.DRAIN WORKER (Lahat~Muaraenim,PbrX6~Kertapati)					
	2.1.New line construction (Merapi~Coal yard L=700m)					
	2.1.1.U type side ditch (direction of railway track)	m		3,600	3,600	
	2.1.2.Catchmento	no		72	72	
	2.1.3.Crossing drain	m		531	531	with the Hume pipe
	④Double tracking work (1) cost					
	1.Construction of making to double-track line section	km		28	28	Refer to the next page.
	(Muaraenim~PbrX6)EARTHWORK COST					
	⑤Double tracking work (2) and (3) cost					
	1.CIVIL WORKS (Lahat~Muaraenim,PbrX6~Kertapati)					
	1.1.Double track line construction (Lt~Me,PbrX6~Kpt)					
	1.1.1.Levelling the land	m ²			713,388	
	1.1.2.New sub ballast					
	(1) Fill section	m ³			131,036	Reinforced roadbed
	(2) Cut section	m ³			107,350	Reinforced roadbed
	1.1.3.Fill worker	m ³			543,963	Purchase soil use
	1.1.4.Pile net worker (Btween Pyk~Kpt)	m ²			131,814	Soft ground measures
	1.1.5.Cut worker	m ³			630,910	
	1.1.6.Vegetation worker					
	(1) Fill section	m ²			202,481	
	(2) Cut section	m ²			189,454	
	2.BRIDGE WORKS (Lahat~Muaraenim,PbrX6~Kertapati)					
	2.1.Superstructure worker					
	2.1.1.Steel girder (Truss)	t			847	Foreign currency
	2.1.2.Steel girder (1 beam,Plate girder)	t			269	Foreign currency
	2.1.3.RC girder	m ³			13	
	2.1.4.H burial girder	m ³			31	
	2.1.5.Bearing and installation	no			108	
	2.2.Substructure worker					
	2.2.1.Pier + Abutment	m ³			10,807	
	2.2.2.Basic construction tesi digging	m ³			9,734	
	2.3.Temporary housing construction	set			1	
	(road and pier for construction)					
	3.DRAIN WORKER (Lahat~Muaraenim,PbrX6~Kertapati)					
	3.1.Double track line construction (Lt~Me,PbrX6~Kpt)					
	3.1.1.U type side ditch (direction of railway track)					
	(1) Fill section	m			62,395	
	(2) Cut section	m			56,500	
	3.1.2.Catchmento					
	(1) Fill section	no			1,248	
	(2) Cut section	no			1,130	
	3.1.3.Crossing drain (Increase length L=6.0m/no)					
	(1) Concrete pipe	no			128	with the Hume pipe
	(2) Box culvert,U type	no			80	Box < 2m
	⑥Installation work cost of additional crossing					
	1.RAILROAD CROSSING (Lt~Me,PbrX6~Kpt)					
	1.1.Existing station improvement (L>930m)					
	1.1.1.Railroad crossing	no		9	13	1no/st.(assumption)
	1.2.Double track line construction					
	1.2.1.Railroad crossing	no			39	3no/st.(assumption)

6. Civil works Quantity summary table - 2

Whole line double-track line making(Only making Lahat-Muaraenim and PbrX6-Kertapati a double-track line)
 ;For the construction of making to double-track line expense calculation between Muaraenim 1/2

No	Work item	Unit	Quantity	Recapitulation
	1.CIVIL WORKS (Lahat~Muaraenim,PbrX6~Kertapati)			
	1.1. Existing sub ballast improvement	m ³	0	Reinforced road
	1.2.Land preparation			
	1 industrial sector;Lt~Me	m ²	234,876	
	2 industrial sectors;X6~Pyk	m ²	325,098	
	3 industrial sectors;Pyk~Kpt	m ²	153,414	
	Total		713,388	
	1.3.New sub ballast			
	1.3.1.Fill section			
	1 industrial sector;Lt~Me	m ³	42,412	Reinforced road
	2 industrial sectors;X6~Pyk	m ³	42,489	Reinforced road
	3 industrial sectors;Pyk~Kpt	m ³	46,135	Reinforced road
	Total		131,036	
	1.3.2.Cut section			
	1 industrial sector;Lt~Me	m ³	36,005	Reinforced road
	2 industrial sectors;X6~Pyk	m ³	64,505	Reinforced road
	3 industrial sectors;Pyk~Kpt	m ³	6,840	Reinforced road
	Total		107,350	
	1.4.Fill worker			
	1 industrial sector;Lt~Me	m ³	229,657	Purchase soil use
	2 industrial sectors;X6~Pyk	m ³	149,037	Purchase soil use
	3 industrial sectors;Pyk~Kpt	m ³	165,269	Purchase soil use
	Total		543,963	
	1.5.Pile net worker (Btween Pyk~Kpt)			
	1 industrial sector;Lt~Me	m ²	0	Soft ground measures
	2 industrial sectors;X6~Pyk	m ²	0	Soft ground measures
	3 industrial sectors;Pyk~Kpt	m ²	131,814	Soft ground measures
	Total		131,814	
	1.6.Cut worker			
	1 industrial sector;Lt~Me	m ³	266,285	
	2 industrial sectors;X6~Pyk	m ³	321,065	
	3 industrial sectors;Pyk~Kpt	m ³	43,560	
	Total		630,910	
	1.7.Vegetation worker			
	1.7.1.Fill section			
	1 industrial sector;Lt~Me	m ²	65,536	
	2 industrial sectors;X6~Pyk	m ²	65,656	
	3 industrial sectors;Pyk~Kpt	m ²	71,289	
	Total		202,481	
	1.7.2.Cut section			
	1 industrial sector;Lt~Me	m ²	63,542	
	2 industrial sectors;X6~Pyk	m ²	113,840	
	3 industrial sectors;Pyk~Kpt	m ²	12,072	
	Total		189,454	
	2.BRIDGE WORKS (Lahat~Muaraenim,PbrX6~Kertapati)			
	2.1.Superstructure worker			
	2.1.1.Steel girder (Truss)			
	1 industrial sector;Lt~Me	t	711	Foreign currency
	2 industrial sectors;X6~Pyk	t	0	Foreign currency
	3 industrial sectors;Pyk~Kpt	t	136	Foreign currency
	Total		847	
	2.1.2.Steel girder (I beam,Plate girder)			
	1 industrial sector;Lt~Me	t	0	Foreign currency
	2 industrial sectors;X6~Pyk	t	19	Foreign currency
	3 industrial sectors;Pyk~Kpt	t	251	Foreign currency
	Total		269	
	2.1.3.RC girder			
	1 industrial sector;Lt~Me	m ³	13	
	2 industrial sectors;X6~Pyk	m ³	0	
	3 industrial sectors;Pyk~Kpt	m ³	0	
	Total		13	

No	Work item	Unit	Quantity	Recapitulation
	2.1.4.H burial girder			
	1 industrial sector;Lt~Me	m ³	31	
	2 industrial sectors;X6~Pyk	m ³	0	
	3 industrial sectors;Pyk~Kpt	m ³	0	
	Total		31	
	2.1.5.Bearing and installation			
	1 industrial sector;Lt~Me	no	44	
	2 industrial sectors;X6~Pyk	no	4	
	3 industrial sectors;Pyk~Kpt	no	60	
	Total		108	
	2.2.Substructure worker			
	2.2.1.Pier + Abutment			
	1 industrial sector;Lt~Me	m ³	6,077	
	2 industrial sectors;X6~Pyk	m ³	288	
	3 industrial sectors;Pyk~Kpt	m ³	4,442	
	Total		10,807	
	2.2.2.Basic construction tesi digging			
	1 industrial sector;Lt~Me	m ³	3,782	
	2 industrial sectors;X6~Pyk	m ³	372	
	3 industrial sectors;Pyk~Kpt	m ³	5,580	
	Total		9,734	
	3.DRAIN WORKER (Lahat~Muaraenim,PbrX6~Kertapati)			
	3.1.U type side ditch (direction of railway track)			
	3.1.1.Fill section			
	1 industrial sector;Lt~Me	m	20,196	
	2 industrial sectors;X6~Pyk	m	20,233	
	3 industrial sectors;Pyk~Kpt	m	21,969	
	Total		62,398	
	3.1.2.Cut section			
	1 industrial sector;Lt~Me	m	18,950	
	2 industrial sectors;X6~Pyk	m	33,950	
	3 industrial sectors;Pyk~Kpt	m	3,600	
	Total		56,500	
	3.2.Catchmento			
	3.2.1.Fill section			
	1 industrial sector;Lt~Me	no	404	
	2 industrial sectors;X6~Pyk	no	405	
	3 industrial sectors;Pyk~Kpt	no	439	
	Total		1,248	
	3.2.2.Cut section			
	1 industrial sector;Lt~Me	no	379	
	2 industrial sectors;X6~Pyk	no	679	
	3 industrial sectors;Pyk~Kpt	no	72	
	Total		1,130	
	3.3.Crossing drain (Increase length L=6.0m/no)			
	3.3.1.Concrete pipe			
	1 industrial sector;Lt~Me	no	96	with the Hume pipe
	2 industrial sectors;X6~Pyk	no	25	with the Hume pipe
	3 industrial sectors;Pyk~Kpt	no	7	with the Hume pipe
	Total		128	
	3.3.2.Box culvert,U type			
	1 industrial sector;Lt~Me	no	35	Box < 2m
	2 industrial sectors;X6~Pyk	no	38	Box < 2m
	3 industrial sectors;Pyk~Kpt	no	7	Box < 2m
	Total		80	
	4.RAILROAD CROSSING (Lt~Me,PbrX6~Kpt)			
	4.1.Railroad crossing			6m×6m×39no
	1 industrial sector;Lt~Me	m ²	432	12no
	2 industrial sectors;X6~Pyk	m ²	756	21no
	3 industrial sectors;Pyk~Kpt	m ²	216	6no
	Total		1,404	

7. Civil works Quantity summary table - 3

④ idea: The coal unloading equipment is constructed in Musi river away from Simpang at about 7km.

⑤ idea: The coal unloading equipment is constructed in Mariana away from Simpang at about 35km.

⑥ idea: The coal unloading equipment is constructed in Gasing away from Simpang at about 45km.

№	Work item	Unit	④ idea	⑤ idea	⑥ idea	Recapitulation
			Quantity	Quantity	Quantity	
	1.CIVIL WORKS (Simpang~Gaing)					
	1.1.New sub ballast	m ³	20,478	99,402	95,072	Reinforced roadbed
	1.2.Levelling the land	m ²	90,008	436,812	417,842	
	1.3.Fill worker	m ³	117,778	567,582	545,372	Purchase soil use
	1.4.Pile net worker (Btween Pyk~Kpt)	m ²	90,008	436,812	417,842	Soft ground measures
	1.5.Vegetation worker	m ²	50,189	248,350	234,649	
	2.BRIDGE WORKS					
	2.1.Superstructure worker					
	2.1.1.Steel girder (60mTruss)	t		1,040	975	Foreign currency
	2.1.2.Steel girder (40mTruss)	t	90	360	360	Foreign currency
	2.2.Substructure worker					
	2.2.1.Pier · Abutment	m ³	408	3,714	4,296	
	2.2.2.Basic construction tesi digging	m ³	372	1,860	1,488	
	2.2.2.Steel pipe yaita idutsu base	m		2,640	3,168	
	3.GIRDER VIADUCT WORKS					
	3.1.Superstructure worker					
	3.1.1.Steel girder (Composite beam,I beam)	t			15,000	Foreign currency
	3.2.Substructure worker					
	3.2.1.Pier · Abutment	m ³			35,400	
	3.2.2.Basic construction tesi digging	m ³			32,400	
	3.2.3.Steel pipe yaita idutsu base	m			27,600	
	4.DRAIN WORKER					
	4.1.U type side ditch (direction of railway track)	m	13,920	68,880	65,080	
	4.2.Catchmento	no	278	1,376	1,300	
	4.3.Crossing drain	m	1,798	8,728	8,349	with the Hume pipe

[Appendix 5-4-2] Civil Works Cost Estimation Basis

Calculation for Construction Quantity and Cost

1. Construction Quantity

1.1. Quantity of Roadbed Improvement

- 1.2. Earth Work Quantity of existing station improvement ; The first stage(existing station improvement >395m)
The second stage(existing station improvement >615m)
The third stage(existing station improvement >930m)

1.3. Earth Work Quantity of making to double-track line

1.4. Transverse Drainage, U-Shape Gutter, Catchment Drain

1.5. Quantity of Bridge Superstructure and Substructure

1.6. Extension in Short Term

- 1.6.1. Construct Coal Handling Plant at Coal Strage Yard far about 0.7km from Merapi

1.7. Extension in Middle and Long Term;

- 1.7.1. Design 4 - Construct Coal Handling Plant at Musi River far about 7km from Simpang
1.7.2. Design 5 - Construct Coal Handling Plant at Mariana far about 35km from Simpang
1.7.3. Design 6 - Construct Coal Handling Plant at Gasing far about 45km from Simpang

2. Construction Cost

2.1. The first stage(Single track improvement, Existing station improvement >395m)

- Calculation Condition;
- (1) Calculate the Extension Cost for Station (Exclude the Construction for Kertapati Station)
 - (2) Exclude the Section between Muaraenim and PbrX6 that Double Tracking Work has been Executed
 - (3) Reinforcement shall not be done for Existing Bridge, Because Reinforcement to bear Design Load 18t has already done.
 - (4) In the Work of Single Track Improvement, only calculate Roadbed Improvement Cost for the Section of Track covered by sludge

2.2. The second stage(Partial double tracking, Existing station improvement >615m)

- Additional Condition;
- (1) Calculate the Extension Cost for Station (Exclude the Construction for Kertapati Station)
 - (2) Construct 2 Signal Cabin
 - (3) Construct New Line at Coal Strage Yard far about 0.7km from Merapi
 - (4) Calculate the Construction Cost for the Section between Muaraenim and PbrX6 that 60% of Double Tracking Work has been Executed
 - (5) Longitudinal Cross Section is as same as Existing Line

2.3. The third stage(Whole line double tracking, Existing station improvement >930m)

- Additional Condition;
- (1) Calculate the Extension Cost for Station (Exclude the Construction for Kertapati Station)
 - (2) Whole Line Double Tracking (Refer to 2.4.)

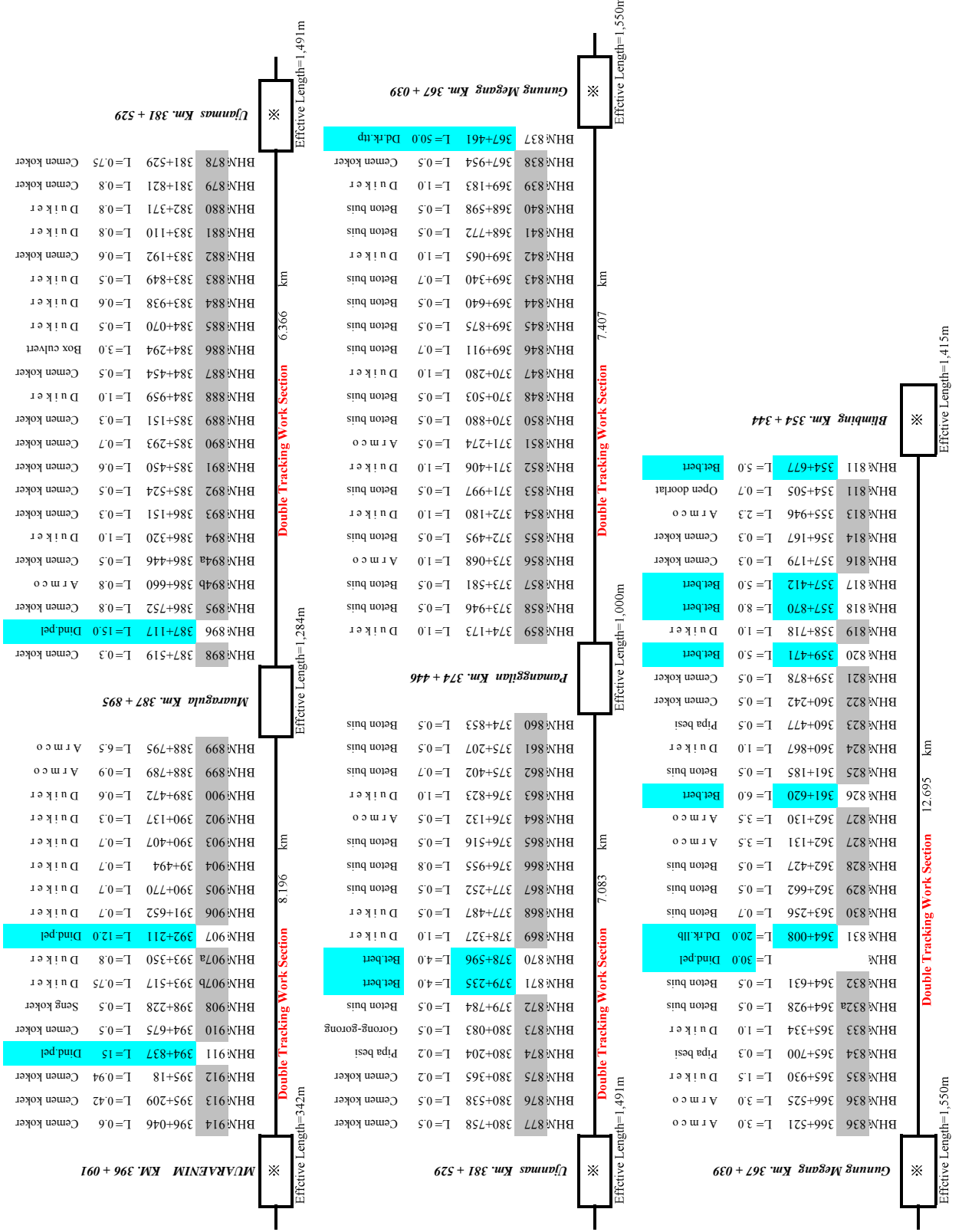
2.4. Whole Line Double Tracking Plan; Calculation for the Cost of Double Tracking Work non beginning Section

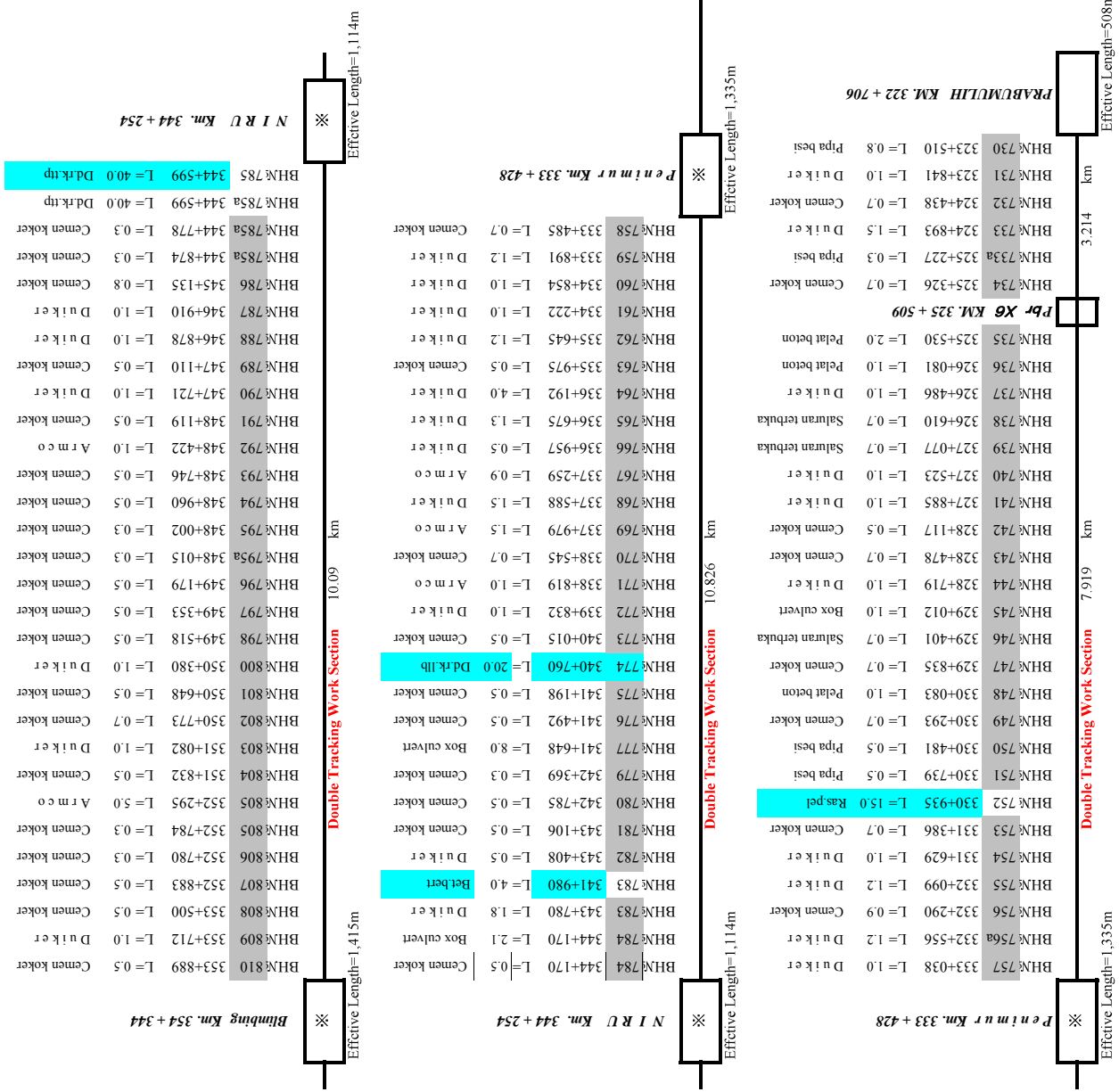
- Calculation Condition;
- (1) New Line shall be parallel to Existing Line away from 6m North Side
 - (2) Exclude Existing Station Improvement and New Station Construction

2.5. Design 4 - Construct Coal Handling Plant at Musi River far about 7km from Simpang

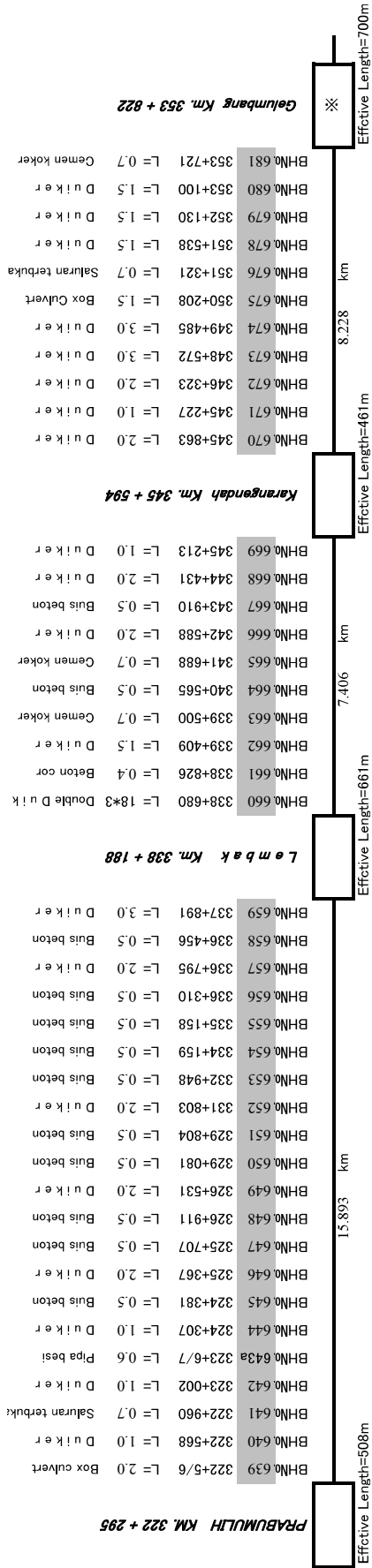
2.6. Design 5 - Construct Coal Handling Plant at Mariana far about 35km from Simpang

2.7. Design 6 - Construct Coal Handling Plant at Gasing far about 45km from Simpang





PRABUMULIH KM. 322 + 295~KERTAPATI KM. 400 + 102



PRABUMULIH KM. 322 + 295

BHN0.639	322+5/6	L= 2.0	Box culvert
BHN0.640	322+568	L= 1.0	Duker
BHN0.641	322+960	L= 0.7	Saluran terbuka
BHN0.642	323+002	L= 1.0	Duker
BHN0.643	323+6/7	L= 0.6	Pipa besi
BHN0.644	324+307	L= 1.0	Duker
BHN0.645	324+381	L= 0.5	Buis beton
BHN0.646	325+367	L= 2.0	Duker
BHN0.647	325+707	L= 0.5	Buis beton
BHN0.648	326+911	L= 0.5	Buis beton
BHN0.649	326+531	L= 2.0	Duker
BHN0.650	329+081	L= 0.5	Buis beton
BHN0.651	329+804	L= 0.5	Buis beton
BHN0.652	331+803	L= 2.0	Duker
BHN0.653	332+948	L= 0.5	Buis beton
BHN0.654	334+159	L= 0.5	Buis beton
BHN0.655	335+158	L= 0.5	Buis beton
BHN0.656	336+310	L= 0.5	Buis beton
BHN0.657	336+795	L= 2.0	Duker
BHN0.658	336+456	L= 0.5	Buis beton
BHN0.659	337+891	L= 3.0	Duker

Lembak Km. 338 + 188

BHN0.660	338+680	L= 18*3	Double Duker
BHN0.661	338+826	L= 0.4	Beton cor
BHN0.662	339+409	L= 1.5	Duker
BHN0.663	339+500	L= 0.7	Cemen koker
BHN0.664	340+565	L= 0.5	Buis beton
BHN0.665	341+688	L= 0.7	Cemen koker
BHN0.666	342+588	L= 2.0	Duker
BHN0.667	343+910	L= 0.5	Buis beton
BHN0.668	344+431	L= 2.0	Duker
BHN0.669	345+213	L= 1.0	Duker

Karangendah Km. 345 + 594

BHN0.670	345+863	L= 2.0	Duker
BHN0.671	345+227	L= 1.0	Duker
BHN0.672	346+323	L= 2.0	Duker
BHN0.673	348+572	L= 3.0	Duker
BHN0.674	349+485	L= 3.0	Duker
BHN0.675	350+208	L= 1.5	Box Culvert
BHN0.676	351+321	L= 0.7	Saluran terbuka
BHN0.678	351+538	L= 1.5	Duker
BHN0.679	352+130	L= 1.5	Duker
BHN0.680	353+100	L= 1.5	Duker
BHN0.681	353+721	L= 0.7	Cemen koker

Gelumbang Km. 353 + 822

BHN0.670	345+863	L= 2.0	Duker
BHN0.671	345+227	L= 1.0	Duker
BHN0.672	346+323	L= 2.0	Duker
BHN0.673	348+572	L= 3.0	Duker
BHN0.674	349+485	L= 3.0	Duker
BHN0.675	350+208	L= 1.5	Box Culvert
BHN0.676	351+321	L= 0.7	Saluran terbuka
BHN0.678	351+538	L= 1.5	Duker
BHN0.679	352+130	L= 1.5	Duker
BHN0.680	353+100	L= 1.5	Duker
BHN0.681	353+721	L= 0.7	Cemen koker

Simpan g Km. 388 + 500

BHN0.670	345+863	L= 2.0	Duker
BHN0.671	345+227	L= 1.0	Duker
BHN0.672	346+323	L= 2.0	Duker
BHN0.673	348+572	L= 3.0	Duker
BHN0.674	349+485	L= 3.0	Duker
BHN0.675	350+208	L= 1.5	Box Culvert
BHN0.676	351+321	L= 0.7	Saluran terbuka
BHN0.678	351+538	L= 1.5	Duker
BHN0.679	352+130	L= 1.5	Duker
BHN0.680	353+100	L= 1.5	Duker
BHN0.681	353+721	L= 0.7	Cemen koker

Payakbung Km. 373 + 335

BHN0.670	345+863	L= 2.0	Duker
BHN0.671	345+227	L= 1.0	Duker
BHN0.672	346+323	L= 2.0	Duker
BHN0.673	348+572	L= 3.0	Duker
BHN0.674	349+485	L= 3.0	Duker
BHN0.675	350+208	L= 1.5	Box Culvert
BHN0.676	351+321	L= 0.7	Saluran terbuka
BHN0.678	351+538	L= 1.5	Duker
BHN0.679	352+130	L= 1.5	Duker
BHN0.680	353+100	L= 1.5	Duker
BHN0.681	353+721	L= 0.7	Cemen koker

Serdang Km. 363 + 479

BHN0.670	345+863	L= 2.0	Duker
BHN0.671	345+227	L= 1.0	Duker
BHN0.672	346+323	L= 2.0	Duker
BHN0.673	348+572	L= 3.0	Duker
BHN0.674	349+485	L= 3.0	Duker
BHN0.675	350+208	L= 1.5	Box Culvert
BHN0.676	351+321	L= 0.7	Saluran terbuka
BHN0.678	351+538	L= 1.5	Duker
BHN0.679	352+130	L= 1.5	Duker
BHN0.680	353+100	L= 1.5	Duker
BHN0.681	353+721	L= 0.7	Cemen koker

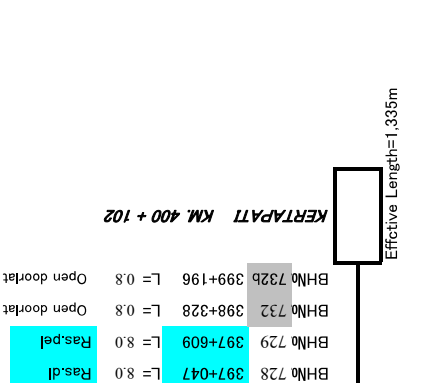
Gelumbang Km. 353 + 822

BHN0.670	345+863	L= 2.0	Duker
BHN0.671	345+227	L= 1.0	Duker
BHN0.672	346+323	L= 2.0	Duker
BHN0.673	348+572	L= 3.0	Duker
BHN0.674	349+485	L= 3.0	Duker
BHN0.675	350+208	L= 1.5	Box Culvert
BHN0.676	351+321	L= 0.7	Saluran terbuka
BHN0.678	351+538	L= 1.5	Duker
BHN0.679	352+130	L= 1.5	Duker
BHN0.680	353+100	L= 1.5	Duker
BHN0.681	353+721	L= 0.7	Cemen koker



KERTAPATI KM. 400 + 102

BHN0.720	389+872	L= 8.0	Ras.dl
BHN0.721	390+786	L= 12.0	Dmd.pel
BHN0.722	392+765	L= 20.0	Dmd.pel
BHN0.723	393+609	L= 12.0	Ras.dl
BHN0.724	394+259	L= 8.0	Ras.dl
BHN0.725	394+757	L= 15.0	Ras.dl
BHN0.726	395+574	L= 15.0	Dmd.pel
BHN0.727	396+192	L= 8.0	Ras.dl
BHN0.728	397+047	L= 8.0	Ras.dl
BHN0.729	397+609	L= 8.0	Ras.dl
BHN0.732	398+328	L= 0.8	Open doorlat
BHN0.732b	399+196	L= 0.8	Open doorlat



Simpan g Km. 388 + 500

BHN0.670	345+863	L= 2.0	Duker
BHN0.671	345+227	L= 1.0	Duker
BHN0.672	346+323	L= 2.0	Duker
BHN0.673	348+572	L= 3.0	Duker
BHN0.674	349+485	L= 3.0	Duker
BHN0.675	350+208	L= 1.5	Box Culvert
BHN0.676	351+321	L= 0.7	Saluran terbuka
BHN0.678	351+538	L= 1.5	Duker
BHN0.679	352+130	L= 1.5	Duker
BHN0.680	353+100	L= 1.5	Duker
BHN0.681	353+721	L= 0.7	Cemen koker

1. Construction Quantity

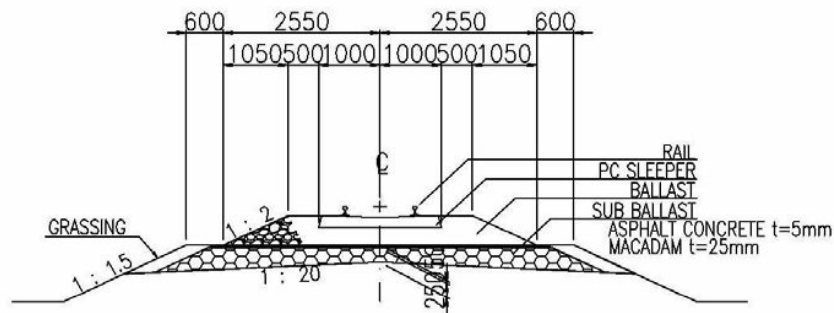
1.1. Short Term; Single Track Improvement

1.1.1. Roadbed Improvement for Existing Line

1) Existing Roadbed Quantity

- Assumption;
- (1) Calculate Approximate Quantity of Roadbed Improvement for Station Section except for Effective Section in Station
 - (2) Calculate Approximate Quantity of Earth Fill Standard Section so as not to have Track Lateral Profile
 - (3) Exclude between Muaraenim and PbrX6 that Double Tracking Work has been Executed
 - (4) Refer to Tracking Work Quantity Table for Improvement Section

[Existing Earth Fill Standard Section]



$$\begin{aligned}
 \text{Roadbed Quantity ;} \quad \text{Section / Asb} &= 2.8 \text{ m}^2 \\
 \text{Volume Vsb} &= \text{Asb} \cdot L \\
 &= 2.8 \times L
 \end{aligned}$$

Here in,

Asb	;	Roadbed Section Area	(m ²)
Vsb	;	Roadbed Volume	(m ³)
L	;	Total Length	(m)

Existing Roadbed Improvement Quantity Table

Station Name Change	Existing Roadbed Improvement Quantity					
		Length L(m)		Roadbed Volume Vsb(m ³)		Earth Fill Volume Vf(m ³)
Lahat 434km+169	-	-	-	-	-	-
	-	526	8,787	1,473	24,604	-
Sukacinta 423km+632	-	5,034		14,095		-
Banjarsari 406km+831	-	3,227		9,036		-
Muaraenim 369km+093	-	-		-		-
⇕	-	-	-	-	-	-
Double Tracking Work Section	-	-	-	-	-	-
⇕	-	-	-	-	-	-
PbrX6 325km+509	-	-	-	-	-	-
	-	170	2,722	476	7,621	-
Prabumulih 322km+295	-	795		2,226		-
Lembak 338km+188	-	370		1,036		-
Karangendah 345km+594	-	411		1,151		-
Glumbang 353km+822	-	483		1,352		-
Serdang 363km+479	-	493		1,380		-
Payakabung 373km+335	-	5,000		14,000		-
Simpang 388km+500	-	11,602		32,486		46,486
Kertapati 400km+102	-	-	-	-	-	
Lt~Me X6~Ktp Total		28,111	28,111	78,711	78,711	-

Existing Roadbed Improvement Quantity Table

Station Name	Earth Fill Quantity				Cutting Quantity			
	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Earth Fill Volume Vf(m ³)	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Cutting Volume Vf(m ³)
Change								
Lahat 434km+169	0.00	-	-	-	0.80	70	133	469
Sukacinta 423km+652	1.00	100	210	390	0.20	163	310	505
Banjarsari 406km+831	2.40	100	210	1,230	0.20	75	143	233
Mtaraenim 369km+093	2.70	58	122	818	0.00	-	-	-
⇕ Double Tracking Work Section								
⇕								
PbrX6 325km+509	-	-	-	-	-	-	-	-
Prabumulih 322km+295	0.00	-	-	-	0.00	-	-	-
Leribak 338km+188	0.00	-	-	-	0.00	-	-	-
Karangendah 345km+594	0.00	-	-	-	0.00	-	-	-
Glumbang 353km+822	0.00	-	-	-	0.00	-	-	-
Serdang 363km+479	0.00	-	-	-	0.00	-	-	-
Payakabung 373km+335	0.00	-	-	-	0.80	-	-	-
Simpang 388km+500	0.00	-	-	-	0.00	-	-	-
Kertapati 400km+102	0.00	-	-	-	0.00	-	-	-
Lt~Me X6~Ktp Total	1.93	258	542	2,438	0.65	308	586	1,207

• Land Preparation Area $A = 566 \text{ m} \times 6.0 = 3,396.0 \text{ m}^2$

• Soft Foundation Countermeasure Section (Py,k~Kpt) $A = 0 \text{ m} \times 6.0 = 0.0 \text{ m}^2$

• Slope Work

Earth Fill Section $A = 1.93 \times \sqrt{(1.5 + 1)} \times 258 = 898.0 \text{ m}^2$

Cutting Section $A = 0.65 \times \sqrt{(1.5 + 1)} \times 308 = 361.0 \text{ m}^2$

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km	ntang hulu	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h+L(m)	(h1+h2)/2	L(m)	h+L(m)	
		395km	+300	-6.32							
			+400	-9.12				-7.72	-	-	
			+500	-8.63				-8.88	-	-	
			+600	-5.13				-6.88	-	-	
			+700	-7.43				-6.28	-	-	
			+800	3.64				-1.90	-	-	
			+900	3.52	3.58	-	-				
			+920		3.58	20.00	71.60				
		396km	+0	3.46	3.49	-	Effective				
		MUARAENIM KM. 396 + 091			Effective length of siding = 342m						
		396km	+91			-	Effective				
			+100	3.46	3.46	-	Effective				
			+200	2.52	2.99	-	Effective				
			+262			-	Effective				
			+300	1.93	2.23	38.00	84.55				
		MUARAENIM			Σ	2.69	58.00	156.15	0.00	0.00	0.00
		406km	+400	1.73							
			+500	-0.34	0.70	-	-				
			+600	-0.50				-0.42	-	-	
			+700	-0.70				-0.60	-	-	
			+719					-0.60	19.00	-11.40	
			+800	-1.13				-0.92	-	Effective	
		Banjarsari Km. 406 + 831			Effective length of siding = 225m						
		406km	+831					-	Effective		
			+900	-2.30				-1.72	-	Effective	
			+944					-	Effective		
		407km	+0	2.27				-0.01	56.00	-0.84	
			+100	2.51	2.39	100.00	239.00				
			+200	-2.54				-0.02	-	-	
			+300	-6.11				-4.33	-	-	
			+400	-3.74				-4.93	-	-	
		Banjarsari			Σ	2.39	100.00	239.00	-0.16	75.00	-12.24
		423km	+100	0.55							
			+200	-0.33	0.11	-	-				
			+300	-0.79				-0.56	-	-	
			+400	1.88	0.55	-	-				
			+500	0.02	0.95	100.00	95.00				
			+563					-0.06	63.00	-3.78	
			+600	-0.13				-0.06	-	Effective	
		Sukacinta Km. 423 + 632			Effective length of siding = 137m						
		423km	+632					-	Effective		
		423km	+700	-0.03				-0.08	-	Effective	
			+800	-0.21				-0.12	-	-	
			+900	-0.19				-0.20	100.00	-20.00	
		424km	+0	2.65	1.23	-	-				
			+100	-0.92	0.87	-	-				
		Sukacinta			Σ	0.95	100.00	95.00	-0.15	163.00	-23.78
			+700	0.95							
			+800	1.18	1.07	-	-				
			+900	1.17	1.18	-	-				
			+988		2.02	-	-				
		434km	+0	2.86	2.02	-	Effective				
			+100	-0.23	1.32	-	Effective				
		L A H A T KM. 434 + 159			Effective length of siding = 342m						
		434km	+159					-	Effective		
			+200	-0.51				-0.37	-	Effective	
			+300	-1.40				-0.96	-	Effective	
			+330					-0.96	-	Effective	
			+400	-0.15				-0.78	70.00	-54.25	
			+500	-2.23				-1.19	-	-	
			+600	-2.34				-2.29	-	-	
			+700	-2.34				-2.34	-	-	
		L A H A T			Σ	0.00	0.00	0.00	-0.78	70.00	-54.25

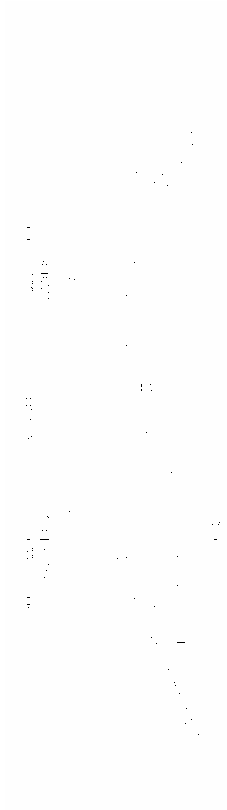
1.2.2. The Second stage

(1) Earth Fill and Cutting Quantity

Assumption;

- (a) In case that Effective Length of Station Section is less than 695m, that shall be 700m
- (b) Longitudinal Cross Section is as same as Existing Line and Refer to Value of Existing Longitudinal Cross Line Table for the Height of Earth Fill and Cutting
- (c) New Line shall be parallel to Existing Line away from 6m North Side
- (d) Calculate Approximate Quantity of Earth Fill Standard Section so as not to have Track Lateral Profile
- (e) Exclude between Muaraenim and PbrX6 that Double Tracking Work has been Executed
- (f) Location of Signal Cabin shall be between Prabumulih and Lembak, Payakabuning and Simpang

[Earth Fill Standard Section]



$$\begin{aligned} \text{Roadbed Quantity;} \quad & \text{Section Area} \quad \text{Asb} = 2.1 \text{ m}^2 \\ & \text{Volume} \quad \text{Vsb} = \text{Asb} \cdot L \\ & = 2.1 \times L \end{aligned}$$

$$\begin{aligned} \text{Earth Fill Quantity;} \quad & \text{Volume} \quad \text{Vf} = (X \cdot h - \text{Asb}) \times L \\ & = (6.0 \times h - 2.1) \times L \end{aligned}$$

[Cutting Standard Section]



$$\begin{aligned} \text{Roadbed Quantity;} \quad & \text{Section Area} \quad \text{Asb} = 1.9 \text{ m}^2 \\ & \text{Volume} \quad \text{Vsb} = \text{Asb} \cdot L \\ & = 1.9 \times L \end{aligned}$$

$$\begin{aligned} \text{Cutting Quantity;} \quad & \text{Volume} \quad \text{Vc} = (X \cdot h + \text{Asb}) \times L \\ & = (6.0 \times h + 1.9) \times L \end{aligned}$$

Here in,

Asb	;	Roadbed Section Area	(m ²)
Vsb	;	Roadbed Volume	(m ³)
L	;	Total Length	(m)
Vf	;	Earth Fill Volume	(m ³)
X	;	Track Interval	(m)
Vc	;	Cutting Volume	(m ³)

= 6.0 m

Existing Roadbed Improvement Quantity Table

Station Name	Earth Fill Quantity				Cutting Quantity			
	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Earth Fill Volume Vf(m ³)	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Cutting Volume Vf(m ³)
Change								
Lahat 434km+169	1.40	288	605	1,814	0.80	70	133	469
Sukacinta 423km+652	1.10	300	630	1,350	0.20	263	500	815
Banjarsari 406km+831	1.60	200	420	1,500	0.50	275	523	1,348
Mtaraenim 369km+093	3.30	158	332	2,797	4.10	200	380	5,300
⇕ Double Tracking Work Section	-	-	-	-	-	-	-	-
⇕	-	-	-	-	-	-	-	-
PbrX6 325km+509	-	-	-	-	-	-	-	-
Prabumulih 322km+295	0.90	192	403	634	0.00	-	-	-
Lembak 338km+188	0.00	-	-	-	0.00	-	-	-
Karangendah 345km+594	3.20	239	502	4,087	0.00	-	-	-
Glumbang 353km+822	0.00	-	-	-	0.00	-	-	-
Serdang 363km+479	0.00	-	-	-	0.00	-	-	-
Payakabung 373km+335	0.00	-	-	-	0.80	218	414	1,461
Simpang 388km+500	0.00	-	-	-	0.00	-	-	-
Kertapati 400km+102	0.00	-	-	-	0.00	-	-	-
Lt~Me X6~Ktp Total	1.82	1,377	2,892	12,182	1.53	1,026	1,950	9,393

• Land Preparation Area $A = 2,403 \text{ m} \times 6.0 = 14,418.0 \text{ m}^2$

• Soft Foundation Countermeasure Section (Pyk~Kpt) $A = 0 \text{ m} \times 6.0 = 0.0 \text{ m}^2$

• Slope Work

Earth Fill Section $A = 1.82 \times \sqrt{(1.5 + 1)} \times 1,377 = 4,518.0 \text{ m}^2$

Cutting Section $A = 1.53 \times \sqrt{(1.5 + 1)} \times 1,026 = 2,830.0 \text{ m}^2$

(2) New establishment Signal Cabin

Station Name	Earth Fill Quantity			Cutting Quantity		
	Height h(m)	Length L(m)	Earth Fill Volume Vf(m ³)	Height h(m)	Length L(m)	Cutting Volume Vf(m ³)
Changeage	-	-	-	-	-	-
Lahat 434km+169	-	-	-	-	-	-
Mitranenim 369km+093	-	-	-	-	-	-
⇕ Double Tracking Work Section	-	-	-	-	-	-
⇕	-	-	-	-	-	-
PbrX6 325km+509	-	-	-	-	-	-
Prabumulih 322km+295	-	-	-	-	-	-
Signal Cabin Near 330km	2.10	400	840	1.60	300	3,450
Lembak 338km+188	-	-	-	-	-	-
Karangendah 345km+594	-	-	-	-	-	-
Glumbang 353km+822	-	-	-	-	-	-
Serdang 363km+479	-	-	-	-	-	-
Payakabung 373km+335	-	-	-	-	-	-
Signal Cabin Near 380km	2.40	700	1,470	0.00	-	-
Simpang 388km+500	-	-	-	-	-	-
Kertapati 400km+102	-	-	-	-	-	-
Lt~Me X6~Ktp Total	2.29	1,100	2,310	1.92	300	3,450

• Land Preparation Area $A = 1,400 \text{ m} \times 6.0 = 8,400.0 \text{ m}^2$

• Soft Foundation Countermeasure Section (Py,k~Kpt) $A = 700 \text{ m} \times 6.0 = 4,200.0 \text{ m}^2$

• Slope Work

Earth Fill Section $A = 2.29 \times \sqrt{(1.5 + 1)} \times 1,100 = 4,541.0 \text{ m}^2$

Cutting Section $A = 1.92 \times \sqrt{(1.5 + 1)} \times 300 = 1,038.0 \text{ m}^2$

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km	ntang hulu	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h+L(m)	(h1+h2)/2	L(m)	h+L(m)	
		395km		+300	-6.32						
				+400	-9.12				-7.72	-	
				+500	-8.63				-8.88	-	
				+600	-5.13				-6.88	-	
				+700	-7.43				-6.28	100.00	
				+800	3.64				-1.90	100.00	
				+900	3.52	3.58	100.00	358.00		-628.00	
				+920		3.58	20.00	71.60		-189.50	
		396km		+0	3.46	3.49	-	Effective			
		MUARAENIM KM. 396 + 091			Effective length of siding=			342m			
		396km		+91			-	Effective			
				+100	3.46	3.46	-	Effective			
				+200	2.52	2.99	-	Effective			
				+262			-	Effective			
				+300	1.93	2.23	38.00	84.55			
		MUARAENIM			Σ	3.25	158.00	514.15	-4.09	200.00	-817.50
		406km		+400	1.73						
				+500	-0.34	0.70	100.00	69.50			
				+600	-0.50				-0.42	100.00	
				+700	-0.70				-0.60	100.00	
				+719					-0.60	19.00	
				+800	-1.13				-0.92	-	
		Banjarsari Km. 406 + 831			Effective length of siding=			225m			
		406km		+831					-	Effective	
				+900	-2.30				-1.72	-	
				+944					-	Effective	
		407km		+0	2.27				-0.01	56.00	
				+100	2.51	2.39	100.00	239.00		-0.84	
				+200	-2.54				-0.02	-	
				+300	-6.11				-4.33	-	
				+400	-3.74				-4.93	-	
		Banjarsari			Σ	1.54	200.00	308.50	-0.42	275.00	-114.24
		423km		+100	0.55						
				+200	-0.33	0.11	-	-			
				+300	-0.79				-0.56	-	
				+400	1.88	0.55	-	-			
				+500	0.02	0.95	100.00	95.00			
				+563					-0.06	63.00	
				+600	-0.13				-0.06	-	
		Sukacinta Km. 423 + 632			Effective length of siding=			137m			
		423km		+632					-	Effective	
		423km		+700	-0.03				-0.08	-	
				+800	-0.21				-0.12	100.00	
				+900	-0.19				-0.20	100.00	
		424km		+0	2.65	1.23	100.00	123.00			
				+100	-0.92	0.87	100.00	86.50			
		Sukacinta			Σ	1.02	300.00	304.50	-0.14	263.00	-35.78
				+700	0.95						
				+800	1.18	1.07	100.00	106.50			
				+900	1.17	1.18	100.00	117.50			
				+988		2.02	88.00	177.76			
		434km		+0	2.86	2.02	-	Effective			
				+100	-0.23	1.32	-	Effective			
		L A H A T KM. 434 + 159			Effective length of siding=			342m			
		434km		+159					-	Effective	
				+200	-0.51				-0.37	-	
				+300	-1.40				-0.96	-	
				+330					-0.96	-	
				+400	-0.15				-0.78	70.00	
				+500	-2.23				-1.19	-	
				+600	-2.34				-2.29	-	
				+700	-2.34				-2.34	-	
		L A H A T			Σ	1.40	288.00	401.76	-0.78	70.00	-54.25

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT								
No Urut	B H No	Letak Km	ntang hulu	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)
		414km	+0	-0.35						
			+100	-1.67						
			+200	-2.86						
			+300	4.62						
			+400	-2.05						
			+500	5.66	1.81	100.00	180.50			
			+600	-2.29	1.69	100.00	168.50			
			+700	-2.18				-2.24	100.00	-223.50
			+800	-1.76				-1.97	100.00	-197.00
			+900	5.61	1.93	100.00	192.50			
		415km	+0	-0.01	2.80	100.00	280.00			
			+100	-1.03				-0.52	100.00	-52.00
			+200	1.12	0.05	0.00	0.00			
			+300	0.26	0.69	0.00	0.00			
			+400	0.55	0.41	0.00	0.00			
			+500	-0.67						
			+600	-0.90						
			+700	-0.14						
			+800	-1.14						
			+900	-0.95						
		416km	+0	-0.34						
Signal Cabin				Σ	2.05	400.00	821.50	-1.58	300.00	-472.50

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI									
No Urut	B H No	Letak Km	ntang (hulu	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)	
		321km	+800		2.06						
			+900		0.31	1.19	-	-			
		322km	+0		3.00	1.66	-	-			
			+41			1.66	41.00	68.06			
			+100		2.40	2.70	-	Effective			
			+200		-4.10				-0.85	-	Effective
		PRABUMULIH Km. 322 + 295				Effective length of siding=			508m		
		322km	+295							-	Effective
			+300		-1.44				-2.77	-	Effective
			+400		1.73	0.15	-	Effective			
			+500		1.44	1.59	-	Effective			
			+549				-	Effective			
			+600		1.41	1.43	51.00	72.68			
			+700		-0.96	0.23	100.00	22.50			
			+800		-1.42				-1.19	-	-
		PRABUMULIH			Σ	0.85	192.00	163.24	0.00	0.00	0.00
		337km	+600		-1.26						
			+700		-1.06				-1.16	-	-
			+759						-1.16	-	-
			+800		0.97				-0.05	-	Effective
			+900		2.58	1.78	-	Effective			
		338km	+0		-0.98	0.80	-	Effective			
		L e m b a k Km. 338 + 090				Effective length of siding=			661m		
		338km	+90							-	Effective
			+100		-2.17				-1.58	-	Effective
			+200		-2.67				-2.42	-	Effective
			+300		-2.55				-2.61	-	Effective
			+400		-1.35				-1.95	-	Effective
			+420							-	Effective
			+500		0.75				-0.30	-	-
			+600		4.59	2.67	-	-			
		L e m b a k			Σ	0.00	0.00	0.00	0.00	0.00	0.00
		345km	+0		-1.16						
			+100		-0.20				-0.68	-	-
			+200		3.79	1.80	-	-			
			+300		0.64	2.22	-	-			
			+319			2.22	19.00	42.18			
			+400		-1.51				-0.44	-	Effective
			+500		-2.09				-1.80	-	Effective
		Karangendah Km. 345 + 549				Effective length of siding=			461m		
		345km	+549							-	Effective
			+600		-1.80				-1.95	-	Effective
			+700		-0.67				-1.24	-	Effective
			+780			0.34	-	Effective			
			+800		1.34	0.34	20.00	6.70			
			+900		4.82	3.08	100.00	308.00			
		346km	+0		3.26	4.04	100.00	404.00			
		Karangendah			Σ	3.18	239.00	760.88	0.00	0.00	0.00
			+300		-1.77						
			+400		-2.02				-1.90	-	-
			+500		-2.50				-2.26	-	-
			+600		-1.69				-2.10	-	Effective
			+700		0.28				-0.71	-	Effective
			+800		-0.42				-0.07	-	Effective
		Glumbang Km. 353 + 833				Effective length of siding=			700m		
		353km	+833							-	Effective
			+900		-0.22				-0.32	-	Effective
		354km	+0		-0.27				-0.25	-	Effective
			+100		-0.18				-0.23	-	Effective
			+200		-0.35				-0.27	-	Effective
			+300		-0.06				-0.21	-	-
		Glumbang			Σ	0.00	0.00	0.00	0.00	0.00	0.00

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)
		363km	+0	-1.21						
			+100	-1.25				-1.23	-	-
			+200	-0.39				-0.82	-	Effective
			+300	2.32	0.97	-	Effective			
			+400	0.45	1.39	-	Effective			
		Serdang Km. 363 + 479			Effective length of siding=			700m		
		363km	+479							
			+500	-0.40	0.03	-	Effective			
			+600	-2.33				-1.37	-	Effective
			+700	-2.78				-2.56	-	Effective
			+800	-1.23				-2.01	-	Effective
			+900	0.81				-0.21	-	-
		364km	+0	3.15	1.98	-	-			
		Serdang		Σ	0.00	0.00	0.00	0.00	0.00	0.00
		372km	+800	-0.77						
			+900	0.12				-0.33	-	-
		373km	+0	1.23	0.68	-	-			
			+89		1.12	-	-			
			+100	1.01	1.12	-	Effective			
			+200	-1.48				-0.24	-	Effective
			+300	-2.56				-2.02	-	Effective
		Payakabung Km. 373 + 335			Effective length of siding=			493m		
		373km	+335						-	Effective
			+400	-2.41				-2.49	-	Effective
			+500	-1.88				-2.15	-	Effective
			+582						-	Effective
			+600	-1.01				-1.45	18.00	-26.01
			+700	-0.74				-0.88	100.00	-87.50
			+800	-0.44				-0.59	100.00	-59.00
		Payakabung		Σ	0.00	0.00	0.00	-0.79	218.00	-172.51
		388km	+0	1.31						
			+100	1.36	1.34	-	-			
			+200	1.12	1.24	-	Effective			
			+300	1.01	1.07	-	Effective			
			+400	1.17	1.09	-	Effective			
		Simpang Km. 388 + 500			Effective length of siding=			706m		
		388km	+500	1.04	0.52	-	Effective			
			+600	1.19	1.12	-	Effective			
			+700	1.26	1.23	-	Effective			
			+800	1.00	1.13	-	Effective			
			+900	1.31	1.16	-	-			
		389km	+0	1.59	1.45	-	-			
		Simpang		Σ	0.00	0.00	0.00	0.00	0.00	0.00
		KERTAPATI KM. 399 + 915			Effective length of siding=			1335m		
		399km	+915							

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)
		379km	+0	2.27						
			+100	2.70						
			+200	1.91						
			+300	1.65						
			+400	1.12						
			+500	1.47						
			+600	2.23	1.85	100.00	185.00			
			+700	2.20	2.22	100.00	221.50			
			+800	2.85	2.53	100.00	252.50			
			+900	1.91	2.38	100.00	238.00			
		380km	+0	2.71	2.31	100.00	231.00			
			+100	2.35	2.53	100.00	253.00			
			+200	2.33	2.34	100.00	234.00			
			+300	3.18	2.76	0.00	0.00			
			+400	2.55	2.87	0.00	0.00			
			+500	2.55	2.55	0.00	0.00			
			+600	1.56						
			+700	1.78						
			+800	2.48						
			+900	1.70						
		381km	+0	1.84						
		Signal Cabin		Σ	2.31	700.00	1615.00	0.00	0.00	0.00

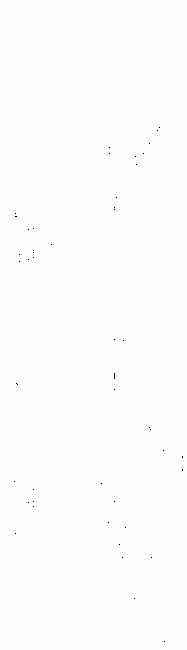
1.2.3. The third stage

(1) Earth Fill and Cutting Quantity

Assumption: ;

- (a) In case that Effective Length of Station Section is less than 930m, that shall be 930m.
- (b) Longitudinal Cross Section is as same as Existing Line and Refer to Value of Existing Longitudinal Cross Line Table for the Height of Earth Fill and Cutting
- (c) New Line shall be parallel to Existing Line away from 6m North Side
- (d) Calculate Approximate Quantity of Earth Fill Standard Section so as not to have Track Lateral Profile
- (e) Exclude between Muaraenin and PbrX6 that Double Tracking Work has been Executed
- (f) Location of Signal Cabin shall be between Prabumulih and Lembak, Payakabuning and Simpang

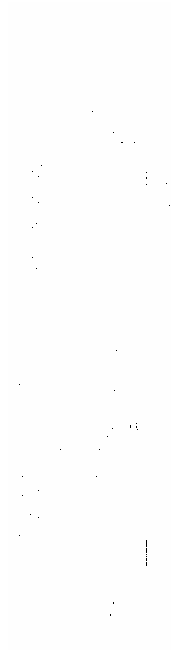
[Earth Fill Standard Section]



$$\begin{aligned} \text{Roadbed Quantity;} & \quad \text{Section Area} & \quad \text{Asb} & = & 2.1 & \text{ m}^2 \\ & \quad \text{Volume} & = & \text{Asb} \times L & & \\ & & = & 2.1 & \times L & \end{aligned}$$

$$\begin{aligned} \text{Earth Fill Quantity;} & \quad \text{Volume} & \quad \text{Vf} & = & (X \cdot h - \text{Asb}) \times L \\ & & = & (& 6.0 & \times h - & 2.1 &) \times L \end{aligned}$$

[Cutting Standard Section]



$$\begin{aligned} \text{Roadbed Quantity;} & \quad \text{Section Area} & \quad \text{Asb} & = & 1.9 & \text{ m}^2 \\ & \quad \text{Volume} & = & \text{Asb} \times L & & \\ & & = & 1.9 & \times L & \end{aligned}$$

$$\begin{aligned} \text{Cutting Quantity;} & \quad \text{Volume} & \quad \text{Vc} & = & (X \cdot h + \text{Asb}) \times L \\ & & = & (& 6.0 & \times h + & 1.9 &) \times L \end{aligned}$$

Here in,

Asb ; Roadbed Section Area (m²)
Vsb ; Roadbed Volume (m³)
L ; Total Length (m)
Vf ; Earth Fill Volume (m³)
X ; Track Interval (m)
Vc ; Cutting Volume (m³)

$$= 6.0 \text{ m}$$

Existing Roadbed Improvement Quantity Table

Station Name	Earth Fill Quantity			Earth Fill Volume			Height h(m)	Length L(m)	Cutting Quantity			Cutting Volume Vf(m ³)
	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Roadbed Volume Vf(m ³)	Earth Fill Volume Vf(m ³)	Roadbed Volume Vsb(m ³)			Length L(m)	Roadbed Volume Vsb(m ³)	Cutting Volume Vf(m ³)	
Change												
Lalait 434km+169	1.40	288	605	1,814	7,461	1,814	1.80	370	703	4,699	4,699	
Sukacinta 423km+632	0.80	500	1,050	1,350	7,461	1,350	0.30	363	690	1,343	1,343	33,840
Banjarsari 406km+831	1.60	200	420	1,500		1,500	1.90	575	1,093	7,648	7,648	
Muaraenim 369km+093	3.30	158	332	2,797		2,797	6.40	500	950	20,150	20,150	
∅	-	-	-	-	-	-	-	-	-	-	-	-
Double Tracking Work Section	-	-	-	-	-	-	-	-	-	-	-	-
∅	-	-	-	-	-	-	-	-	-	-	-	-
PbrX6 325km+509	-	-	-	-	-	-	-	-	-	-	-	-
Prabumulih 322km+295	1.20	392	823	1,999		1,999	1.20	100	190	910	910	
Lembak 338km+188	2.70	100	210	1,410		1,410	0.90	239	454	1,745	1,745	7,875
Karangendah 345km+594	2.70	439	922	6,190	10,589	6,190	0.70	100	190	610	610	
Glumbang 353km+822	0.00	-	-	-		-	1.50	300	570	3,270	3,270	
Serdang 363km+479	2.00	100	210	990		990	0.80	200	380	1,340	1,340	
Payakabung 373km+335	0.90	189	397	624		624	0.70	318	604	1,940	1,940	
Simpang 388km+500	1.40	300	630	1,890		1,890	0.00	-	-	-	-	1,940
Kertapati 400km+102	0.00	-	-	-		-	0.00	-	-	-	-	-
Lt~Me X6~Kip	1.64	2,666	5,599	20,564		20,564	2.37	3,065	5,824	43,655	43,655	
Total	-	-	-	-	-	-	-	-	-	-	-	-
The second stage Total	-	-	2,892	12,182		12,182	-	-	-	1,950	1,950	9,393
The third stage The increase amount	-	-	2,707	8,382		8,382	-	-	-	3,874	3,874	34,262

Land Preparation Area $A = 5,731 \text{ m} \times 6.0 = 34,386.0 \text{ m}^2$
 $(\Delta A = 34,386.0 - 14418.0 = 19,968.0 \text{ m}^2)$

Soft Foundation Countermeasure Section (Pyk~Kpt) $A = 489 \text{ m} \times 6.0 = 2,934.0 \text{ m}^2$
 $(\Delta A = 2,934.0 - 0.0 = 2,934.0 \text{ m}^2)$

Slope Work

Earth Fill Section $A = 1.64 \times \sqrt{(1.5 + 1) \times 2,666} = 7,882.0 \text{ m}^2$
 $(\Delta A = 7,882.0 - 4,518.0 = 3,364.0 \text{ m}^2)$

Cutting Section $A = 2.37 \times \sqrt{(1.5 + 1) \times 3,065} = 13,095 \text{ m}^2$
 $(\Delta A = 13,095.0 - 2,830.0 = 10,265.0 \text{ m}^2)$

(2) New establishment Signal Cabin

Station Name	Earth Fill Quantity			Cutting Quantity				
	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Earth Fill Volume Vf(m ³)	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Cutting Volume Vf(m ³)
Change	-	-	-	-	-	-	-	-
Lihat 434km+169	-	-	-	-	-	-	-	-
Muaracim 369km+093	-	-	-	-	-	-	-	-
⇕	-	-	-	-	-	-	-	-
Double Tracking Work Section	-	-	-	-	-	-	-	-
⇕	-	-	-	-	-	-	-	-
PbrX6 325km+509	-	-	-	-	-	-	-	-
Prabumulih 322km+295	-	-	-	-	-	-	-	-
Signal Cabin Near 330km	1.40	700	1,470	4,410	1.60	300	570	3,450
Lembak 338km+188	-	-	-	-	-	-	-	-
Karangendah 345km+594	-	-	-	-	-	-	-	-
Glumbang 353km+822	-	-	-	-	-	-	-	-
Serdang 363km+479	-	-	-	-	-	-	-	-
Payakabung 373km+335	-	-	-	-	-	-	-	-
Signal Cabin Near 380km	2.50	1,000	2,100	12,900	0.00	-	-	-
Simpang 388km+500	-	-	-	-	-	-	-	-
Kertapati 400km+102	-	-	-	-	-	-	-	-
Lt~Me X6~Kip	2.05	1,700	3,570	17,310	1.92	300	570	3,450
Total	-	-	-	-	-	-	-	-
The second stage Total	-	-	2,310	12,810	-	-	570	3,450
The third stage The increase amount	-	-	1,260	4,500	-	-	0	0

- Land Preparation Area $A = 2,000 \text{ m} \times 6.0 = 12,000.0 \text{ m}^2$
($\Delta A = 12,000.0 - 8400.0 = 3,600.0 \text{ m}^2$)
- Soft Foundation Countermeasure Section (Pyk~Kpt) $A = 1,000 \text{ m} \times 6.0 = 6,000.0 \text{ m}^2$
($\Delta A = 6,000.0 - 4200.0 = 1,800.0 \text{ m}^2$)
- Slope Work
 Earth Fill Section $A = 2.05 \times \sqrt{(1.5 + 1)} \times 1,700 = 6,283.0 \text{ m}^2$
 ($\Delta A = 6,283.0 - 4,541.0 = 1,742.0 \text{ m}^2$)
 Cutting Section $A = 1.92 \times \sqrt{(1.5 + 1)} \times 300 = 1,038.0 \text{ m}^2$
 ($\Delta A = 1,038.0 - 0.0 = 1,038.0 \text{ m}^2$)

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km	ntang hulu	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h+L(m)	(h1+h2)/2	L(m)	h+L(m)	
		395km		+300	-6.32						
				+400	-9.12				-7.72	100.00	-772.00
				+500	-8.63				-8.88	100.00	-887.50
				+600	-5.13				-6.88	100.00	-688.00
				+700	-7.43				-6.28	100.00	-628.00
				+800	3.64				-1.90	100.00	-189.50
				+900	3.52	3.58	100.00	358.00			
				+920		3.58	20.00	71.60			
		396km		+0	3.46	3.49	-	Effective			
		MUARAENIM KM. 396 + 091						Effective length of siding=	342m		
		396km		+91				-	Effective		
				+100	3.46	3.46	-	Effective			
				+200	2.52	2.99	-	Effective			
				+262			-	Effective			
				+300	1.93	2.23	38.00	84.55			
		MUARAENIM			Σ	3.25	158.00	514.15	-6.33	500.00	-3165.00
		406km		+400	1.73						
				+500	-0.34	0.70	100.00	69.50			
				+600	-0.50				-0.42	100.00	-42.00
				+700	-0.70				-0.60	100.00	-60.00
				+719					-0.60	19.00	-11.40
				+800	-1.13				-0.92	-	Effective
		Banjarsari Km. 406 + 831						Effective length of siding=	225m		
		406km		+831					-	Effective	
				+900	-2.30				-1.72	-	Effective
				+944					-	Effective	
		407km		+0	2.27				-0.01	56.00	-0.84
				+100	2.51	2.39	100.00	239.00			
				+200	-2.54				-0.02	100.00	-1.50
				+300	-6.11				-4.33	100.00	-432.50
				+400	-3.74				-4.93	100.00	-492.50
		Banjarsari			Σ	1.54	200.00	308.50	-1.81	575.00	-1040.74
		423km		+100	0.55						
				+200	-0.33	0.11	100.00	11.00			
				+300	-0.79				-0.56	100.00	-56.00
				+400	1.88	0.55	100.00	54.50			
				+500	0.02	0.95	100.00	95.00			
				+563					-0.06	63.00	-3.78
				+600	-0.13				-0.06	-	Effective
		Sukacinta Km. 423 + 632						Effective length of siding=	137m		
		423km		+632					-	Effective	
		423km		+700	-0.03				-0.08	-	Effective
				+800	-0.21				-0.12	100.00	-12.00
				+900	-0.19				-0.20	100.00	-20.00
		424km		+0	2.65	1.23	100.00	123.00			
				+100	-0.92	0.87	100.00	86.50			
		Sukacinta			Σ	0.74	500.00	370.00	-0.25	363.00	-91.78
				+700	0.95						
				+800	1.18	1.07	100.00	106.50			
				+900	1.17	1.18	100.00	117.50			
				+988		2.02	88.00	177.76			
		434km		+0	2.86	2.02	-	Effective			
				+100	-0.23	1.32	-	Effective			
		L A H A T KM. 434 + 159						Effective length of siding=	342m		
		434km		+159					-	Effective	
				+200	-0.51				-0.37	-	Effective
				+300	-1.40				-0.96	-	Effective
				+330					-0.96	-	Effective
				+400	-0.15				-0.78	70.00	-54.25
				+500	-2.23				-1.19	100.00	-119.00
				+600	-2.34				-2.29	100.00	-228.50
				+700	-2.34				-2.34	100.00	-234.00
		L A H A T			Σ	1.40	288.00	401.76	-1.72	370.00	-635.75

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT								
No Urut	B H No	Letak Km	ntang hulu	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)
		414km	+0	-0.35						
			+100	-1.67						
			+200	-2.86						
			+300	4.62						
			+400	-2.05						
			+500	5.66	1.81	100.00	180.50			
			+600	-2.29	1.69	100.00	168.50			
			+700	-2.18				-2.24	100.00	-223.50
			+800	-1.76				-1.97	100.00	-197.00
			+900	5.61	1.93	100.00	192.50			
		415km	+0	-0.01	2.80	100.00	280.00			
			+100	-1.03				-0.52	100.00	-52.00
			+200	1.12	0.05	100.00	4.50			
			+300	0.26	0.69	100.00	69.00			
			+400	0.55	0.41	100.00	40.50			
			+500	-0.67						
			+600	-0.90						
			+700	-0.14						
			+800	-1.14						
			+900	-0.95						
		416km	+0	-0.34						
Signal Cabin				Σ	1.34	700.00	935.50	-1.58	300.00	-472.50

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI									
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)	
		321km	+800	2.06							
			+900	0.31	1.19	100.00	118.50				
		322km	+0	3.00	1.66	100.00	165.50				
			+41		1.66	41.00	68.06				
			+100	2.40	2.70	-	Effective				
			+200	-4.10				-0.85	-	Effective	
		PRABUMULIH Km. 322 + 295			Effective length of siding=			508m			
		322km	+295						-	Effective	
			+300	-1.44				-2.77	-	Effective	
			+400	1.73	0.15	-	Effective				
			+500	1.44	1.59	-	Effective				
			+549			-	Effective				
			+600	1.41	1.43	51.00	72.68				
			+700	-0.96	0.23	100.00	22.50				
			+800	-1.42				-1.19	100.00	-119.00	
		PRABUMULIH			Σ	1.14	392.00	447.24	-1.19	100.00	-119.00
		337km	+600	-1.26							
			+700	-1.06				-1.16	100.00	-116.00	
			+759					-1.16	59.00	-68.44	
			+800	0.97				-0.05	-	Effective	
			+900	2.58	1.78	-	Effective				
		338km	+0	-0.98	0.80	-	Effective				
		L e m b a k Km. 338 + 090			Effective length of siding=			661m			
		338km	+90						-	Effective	
			+100	-2.17				-1.58	-	Effective	
			+200	-2.67				-2.42	-	Effective	
			+300	-2.55				-2.61	-	Effective	
			+400	-1.35				-1.95	-	Effective	
			+420						-	Effective	
			+500	0.75				-0.30	80.00	-24.00	
			+600	4.59	2.67	100.00	267.00				
		L e m b a k			Σ	2.67	100.00	267.00	-0.87	239.00	-208.44
		345km	+0	-1.16							
			+100	-0.20				-0.68	100.00	-68.00	
			+200	3.79	1.80	100.00	179.50				
			+300	0.64	2.22	100.00	221.50				
			+319		2.22	19.00	42.18				
			+400	-1.51				-0.44	-	Effective	
			+500	-2.09				-1.80	-	Effective	
		Karangendah Km. 345 + 549			Effective length of siding=			461m			
		345km	+549						-	Effective	
			+600	-1.80				-1.95	-	Effective	
			+700	-0.67				-1.24	-	Effective	
			+780		0.34	-	Effective				
			+800	1.34	0.34	20.00	6.70				
			+900	4.82	3.08	100.00	308.00				
		346km	+0	3.26	4.04	100.00	404.00				
		Karangendah			Σ	2.65	439.00	1161.88	-0.68	100.00	-68.00
			+300	-1.77							
			+400	-2.02				-1.90	100.00	-189.50	
			+500	-2.50				-2.26	100.00	-226.00	
			+600	-1.69				-2.10	-	Effective	
			+700	0.28				-0.71	-	Effective	
			+800	-0.42				-0.07	-	Effective	
		Glumbang Km. 353 + 833			Effective length of siding=			700m			
		353km	+833						-	Effective	
			+900	-0.22				-0.32	-	Effective	
		354km	+0	-0.27				-0.25	-	Effective	
			+100	-0.18				-0.23	-	Effective	
			+200	-0.35				-0.27	-	Effective	
			+300	-0.06				-0.21	100.00	-20.50	
		Glumbang			Σ	0.00	0.00	0.00	-1.45	300.00	-436.00

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI									
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)	
		363km	+0	-1.21							
			+100	-1.25				-1.23	100.00	-123.00	
			+200	-0.39				-0.82	-	Effective	
			+300	2.32	0.97	-	Effective				
			+400	0.45	1.39	-	Effective				
		Serdang Km. 363 + 479			Effective length of siding=			700m			
		363km	+479			-	Effective				
			+500	-0.40	0.03	-	Effective				
			+600	-2.33				-1.37	-	Effective	
			+700	-2.78				-2.56	-	Effective	
			+800	-1.23				-2.01	-	Effective	
			+900	0.81				-0.21	100.00	-21.00	
		364km	+0	3.15	1.98	100.00	198.00				
		Serdang			Σ	1.98	100.00	198.00	-0.72	200.00	-144.00
		372km	+800	-0.77							
			+900	0.12				-0.33	100.00	-32.50	
		373km	+0	1.23	0.68	100.00	67.50				
			+89		1.12	89.00	99.68				
			+100	1.01	1.12	-	Effective				
			+200	-1.48				-0.24	-	Effective	
			+300	-2.56				-2.02	-	Effective	
		Payakabung Km. 373 + 335			Effective length of siding=			493m			
		373km	+335						-	Effective	
			+400	-2.41				-2.49	-	Effective	
			+500	-1.88				-2.15	-	Effective	
			+582						-	Effective	
			+600	-1.01				-1.45	18.00	-26.01	
			+700	-0.74				-0.88	100.00	-87.50	
			+800	-0.44				-0.59	100.00	-59.00	
		Payakabung			Σ	0.88	189.00	167.18	-0.64	318.00	-205.01
		388km	+0	1.31							
			+100	1.36	1.34	100.00	133.50				
			+200	1.12	1.24	-	Effective				
			+300	1.01	1.07	-	Effective				
			+400	1.17	1.09	-	Effective				
		Simpang Km. 388 + 500			Effective length of siding=			706m			
		388km	+500	1.04	0.52	-	Effective				
			+600	1.19	1.12	-	Effective				
			+700	1.26	1.23	-	Effective				
			+800	1.00	1.13	-	Effective				
			+900	1.31	1.16	100.00	115.50				
		389km	+0	1.59	1.45	100.00	145.00				
		Simpang			Σ	1.31	300.00	394.00	0.00	0.00	0.00
		KERTAPATI KM. 399 + 915			Effective length of siding=			1335m			
		399km	+915								

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)
		379km	+0	2.27						
			+100	2.70						
			+200	1.91						
			+300	1.65						
			+400	1.12						
			+500	1.47						
			+600	2.23	1.85	100.00	185.00			
			+700	2.20	2.22	100.00	221.50			
			+800	2.85	2.53	100.00	252.50			
			+900	1.91	2.38	100.00	238.00			
		380km	+0	2.71	2.31	100.00	231.00			
			+100	2.35	2.53	100.00	253.00			
			+200	2.33	2.34	100.00	234.00			
			+300	3.18	2.76	100.00	275.50			
			+400	2.55	2.87	100.00	286.50			
			+500	2.55	2.55	100.00	255.00			
			+600	1.56						
			+700	1.78						
			+800	2.48						
			+900	1.70						
		381km	+0	1.84						
Signal Cabin				Σ	2.43	1000.00	2432.00	0.00	0.00	0.00

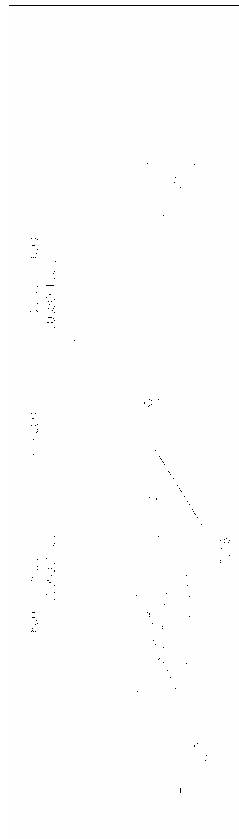
1.3. Earth Work Quantity of making to double-track line

(1) Earth Fill and Cutting Quantity

Assumption;

- (a) Earth Fill and Cutting Quantity except the Kertapati station are calculated.
- (b) Longitudinal Cross Section is as same as Existing Line and Refer to Value of Existing Longitudinal Cross Line Table for the Height of Earth Fill and Cutting
- (c) New Line shall be parallel to Existing Line away from 6m North Side
- (d) Calculate Approximate Quantity of Earth Fill Standard Section so as not to have Track Lateral Profile
- (e) Exclude between Muaraenim and PbrX6 that Double Tracking Work has been Executed

[Earth Fill Standard Section]



$$\begin{aligned} \text{Roadbed Quantity;} & \quad \text{Section Area} & \quad \text{Asb} & = & 2.1 & \text{m}^2 \\ & \quad \text{Volume} & \quad \text{Vsb} & = & \text{Asb} \cdot L & \\ & & & = & 2.1 & \times L \end{aligned}$$

$$\begin{aligned} \text{Earth Fill Quantity;} & \quad \text{Volume} & \quad \text{Vf} & = & (X \cdot h - \text{Asb}) \times L \\ & & & = & (6.0 \times h - 2.1) \times L \end{aligned}$$

[Cutting Standard Section]



$$\begin{aligned} \text{Roadbed Quantity;} & \quad \text{Section Area} & \quad \text{Asb} & = & 1.9 & \text{m}^2 \\ & \quad \text{Volume} & \quad \text{Vsb} & = & \text{Asb} \cdot L & \\ & & & = & 1.9 & \times L \end{aligned}$$

$$\begin{aligned} \text{Cutting Quantity;} & \quad \text{Volume} & \quad \text{Vc} & = & (X \cdot h + \text{Asb}) \times L \\ & & & = & (6.0 \times h + 1.9) \times L \end{aligned}$$

Here in,

	Asb	;	Roadbed Section Area	(m ²)
	Vsb	;	Roadbed Volume	(m ³)
	L	;	Total Length	(m)
	Vf	;	Earth Fill Volume	(m ³)
	X	;	Track Interval	(m)
	Vc	;	Cutting Volume	(m ³)

= 6.0 m

Existing Roadbed Improvement Quantity Table

Station Name	Earth Fill Quantity				Cutting Quantity			
	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Earth Fill Volume Vf(m ³)	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Cutting Volume Vf(m ³)
Change	-	-	-	-	-	-	-	-
Lahat 434km+169	1.50	6,000	12,600	41,400	1.10	5,100	9,690	43,350
Sukacinta 423km+632	2.40	8,510	17,871	104,673	2.20	8,100	15,390	122,310
Banjarsari 406km+831	2.80	5,686	11,941	83,584	2.60	5,750	10,925	100,625
Muaracim 369km+093	-	-	-	-	-	-	-	-
⇕	-	-	-	-	-	-	-	-
Double Tracking Work Section	-	-	-	-	-	-	-	-
⇕	-	-	-	-	-	-	-	-
PbrX6 325km+509	1.40	1,550	3,255	9,765	1.00	1,150	2,185	9,085
Prabumulih 322km+295	1.40	7,600	15,960	47,880	1.20	8,600	16,340	78,260
Lembak 338km+188	1.70	2,800	5,880	22,680	1.00	4,700	8,930	37,130
Karangendah 345km+594	1.80	2,700	5,670	23,490	1.40	5,600	10,640	57,680
Glumbang 353km+822	1.70	2,583	5,424	20,922	1.20	7,000	13,300	63,700
Serdang 363km+479	1.70	3,000	6,300	24,300	1.50	6,900	13,110	75,210
Payakabung 373km+335	1.70	11,403	23,946	92,364	1.70	3,600	6,840	43,560
Simpang 388km+500	1.50	10,566	22,189	72,905	0.00	-	-	-
Kertapati 400km+102	-	-	-	-	-	-	-	-
Li~Mc X6~Kip	1.80	62,398	131,036	543,963	1.86	56,500	107,350	630,910
Total	-	-	-	-	-	-	-	-
		62,398	131,036	543,963	1.86	56,500	107,350	630,910
						56,500	107,350	630,910
								630,910

•	Land Preparation Area	A =	118,898	m ×	6.0	=	713,388.0	m ²	
		A1 =	39,146	m ×	6.0	=	234,876.0	m ²	
		A2 =	54,183	m ×	6.0	=	325,098.0	m ²	
		A3 =	25,569	m ×	6.0	=	153,414.0	m ²	
•	Soft Fundation Countermeasure Section (Pyk~Kpt)	A3 =	21,969	m ×	6.0	=	131,814.0	m ²	
•	Slope Work								
	Earth Fill Section	A =	1.80 × √(	1.5 + 1)	×	62,398	=	202,481.0	m ²
		A1 =	1.80 × √(	1.5 + 1)	×	20,196	=	65,536.0	m ²
		A2 =	1.80 × √(	1.5 + 1)	×	20,233	=	65,656.0	m ²
		A3 =	1.80 × √(	1.5 + 1)	×	21,969	=	71,289.0	m ²
	Cutting Section	A =	1.86 × √(	1.5 + 1)	×	56,500	=	189,454.0	m ²
		A1 =	1.86 × √(	1.5 + 1)	×	18,950	=	63,542.0	m ²
		A2 =	1.86 × √(	1.5 + 1)	×	33,950	=	113,840.0	m ²
		A3 =	1.86 × √(	1.5 + 1)	×	3,600	=	12,071.0	m ²

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km	ntang	FillorCut	Fill worker			Cut worker			
			hulu	h(m)	(h1+h2)/2	L(m)	h*L(m)	(h1+h2)/2	L(m)	h*L(m)	
444											
		PRABUMULIH KM. 322 + 295									
		322km	+295								
			+300								
			+400								
			+500								
			+600								
			+700								
			+800		-4.01						
			+900		2.40			-0.81	100.00	-80.50	
		323km	+0		3.00	2.70	100.00	270.00			
			+100		0.31	1.66	100.00	165.50			
			+200		2.06	1.19	100.00	118.50			
			+250		3.70	2.88	50.00	144.00			
			+300		-0.39	1.66	50.00	82.75			
			+350		-1.68				-1.04	50.00	-51.75
			+400		-1.72				-1.70	50.00	-85.00
			+450		1.55				-0.09	50.00	-4.25
			+500		-0.56	0.50	50.00	24.75			
			+550		0.66	0.05	50.00	2.50			
			+600		1.65	1.16	50.00	57.75			
			+650		1.85	1.75	50.00	87.50			
			+700		2.18	2.02	50.00	100.75			
			+750		2.12	2.15	50.00	107.50			
			+800		2.42	2.27	50.00	113.50			
			+850		2.21	2.32	50.00	115.75			
			+900		0.46	1.34	50.00	66.75			
			+950		-1.75				-0.65	50.00	-32.25
		324km	+0		-1.82				-1.79	50.00	-89.25
			+50		-2.14				-1.98	50.00	-99.00
			+100		-0.72				-1.43	50.00	-71.50
			+150		-1.13				-0.93	50.00	-46.25
			+200		-1.30				-1.22	50.00	-60.75
			+250		-0.20				-0.75	50.00	-37.50
			+300		-0.55				-0.38	50.00	-18.75
			+350		-0.09				-0.32	50.00	-16.00
			+400		0.84	0.38	50.00	18.75			
			+450		2.03	1.44	50.00	71.75			
			+500		0.48	1.26	50.00	62.75			
			+550		-1.77				-0.65	50.00	-32.25
			+600		-1.86				-1.82	50.00	-90.75
			+650		-1.62				-1.74	50.00	-87.00
			+700		-1.05				-1.34	50.00	-66.75
			+750		-0.02				-0.54	50.00	-26.75
			+800		0.35	0.17	50.00	8.25			
			+850		1.36	0.86	50.00	42.75			
			+900		2.81	2.09	50.00	104.25			
			+950		0.83	1.82	50.00	91.00			
		325km	+0		0.39	0.61	50.00	30.50			
			+50		0.66	0.53	50.00	26.25			
			+100		0.33	0.50	50.00	24.75			
			+150		0.62	0.48	50.00	23.75			
			+200		-0.07	0.28	50.00	13.75			
			+250		-0.73				-0.40	50.00	-20.00
			+300		-0.34				-0.54	50.00	-26.75
			+350		2.65	1.16	50.00	57.75			
			+400		-0.68	0.99	50.00	49.25			
			+450		-0.21				-0.45	50.00	-22.25
			+500		-0.39				-0.30	50.00	-15.00
		Pbr X6 KM. 325 + 509									
		325km	+509								
		Pm~X6			Σ	1.34	1550.00	2083.00	-0.94	1150.00	-1080.25
		Double Tracking Work Section									
		↓									

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km		ntang hulu	FillorCut h(m)	Fill worker			Cut worker		
						(h1+h2)/2	L(m)	h*L(m)	(h1+h2)/2	L(m)	h*L(m)
	752	330km	+935	15	Ras,peI		Pa,bk,Is				
							Pa,bk,Is				
		Penimur Km. 333 + 428									
		333km	+428								
							Pa,bk,Is				
	774	340km	+760	20	Dd,rk,Ilb						
							Pa,bk,Is				
							Pa,bk,Is				
	783	341km	+980	4	Bet,bert						
							Pa,bk,Is				
		N I R U Km. 344 + 254									
		344km	+254								
							Pa,bk,Is				
	785	344km	+599	40	Dd,rk,ttp						
							Pa,bk,Is				
	785a						Pa,bet,Is				
					Dd,rk,ttp						
							Pa,bet,Is				
		Blimbing Km. 354 + 344									
		354km	+344								
							Pa,bk,Is				
	811	354km	+677	5	Bet,bert						
							Pa,bk,Is				
							Pa,bk,Is				
	817	357km	+412	5	Bet,bert						
							Pa,bk,Is				
							Pa,bk,Is				
	818	357km	+870	8	Bet,bert						
							Pa,bk,Is				
							Pa,bk,Is				
	820	359km	+471	5	Bet,bert						
							Pa,bk,Is				
							Pa,bk,Is				
	826	361km	+620	6	Bet,bert						
							Pa,bk,Is				
							Pa,bet,sm				
	831	364km	+8	20	Dind,peI						
							Pi,bet,sm				
		364km	+8	30	Dd,rk,Ilb						
							Pa,bet,sm				

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT								
No Urut	B H No	Letak Km	ntang hulu	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h*L(m)	(h1+h2)/2	L(m)	h*L(m)
		Gunung Megang Km. 367 + 039								
		367km	+39							
							Pa,bk,ls			
	837	367km	+461	50	Dd,rk,ttp		Pa,bk,ls			
							Pa,bk,ls			
		Pamanggilan Km. 374 + 446								
		374km	+446							
							Pa,bk,ls			
	870	378km	+596	4	Bet,bert		Pa,bk,ls			
							Pa,bk,ls			
							Pa,bk,ls			
	871	379km	+235	4	Bet,bert		Pa,bk,ls			
							Pa,bk,ls			
		Ujanmas Km. 381 + 529								
		381km	+529							
							Pa,bk,ls			
	896	387km	+117	15	Dind,pel		Pa,bk,ls			
							Pa,bk,ls			
		Muaragula Km. 387 + 895								
		387km	+895							
							Pa,bk,ls			
	907	392km	+211	12	Dind,pel		Pa,bk,ls			
							Pa,bk,ls			
							Pa,bk,ls			
	911	394km	+837	15	Dind,pel		Pa,bk,ls			
							Pa,bk,ls			
		↑ Double Tracking Work Section								
			+200		-5.38					
		395km	+300		-6.32			-5.85	100.00	-585.00
			+400		-9.12			-7.72	100.00	-772.00
			+500		-8.63			-8.88	100.00	-887.50
			+600		-5.13			-6.88	100.00	-688.00
			+700		-7.43			-6.28	100.00	-628.00
			+800		3.64			-1.90	100.00	-189.50
			+900		3.52	3.58	100.00		358.00	
		396km	+0		3.46	3.49	100.00		349.00	
		MUARAENIM KM. 396 + 091								
		396km	+91							
			+100		3.46	3.46	100.00		346.00	
		396km	+200		2.52	2.99	100.00		299.00	
			+300		1.93	2.23	100.00		222.50	
			+350		2.02	1.98	50.00		98.75	
			+367		2.02	2.02	17.00		34.34	
			+377				Pa,bet,sm			
	915	396km	+427	25	Dd,rk,lib					

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT								
No Urut	B H No	Letak Km	ntang hulu	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h*L(m)	(h1+h2)/2	L(m)	h*L(m)
							Pi.bet.sm			
			50	Dd.rk.ttp						
			25	Dd.rk.llb						
							Pa.bet.sm			
		+477								
		+487		1.88						
		+500		1.88	1.88	13.00	24.44			
		+550		1.20	1.54	50.00	77.00			
		+600		1.20	1.20	50.00	60.00			
		+650		1.60	1.40	50.00	70.00			
		+700		1.70	1.65	50.00	82.50			
		+750		1.85	1.78	50.00	88.75			
		+800		2.01	1.93	50.00	96.50			
		+850		2.79	2.40	50.00	120.00			
		+900		3.46	3.13	50.00	156.25			
		+950		3.70	3.58	50.00	179.00			
		397km +0		-1.54	1.08	50.00	54.00			
		+50		-2.55				-2.05	50.00	-102.25
		+100		-3.04				-2.80	50.00	-139.75
		+150		-3.31				-3.18	50.00	-158.75
		+200		1.06				-1.13	50.00	-56.25
		+250		-4.72				-1.83	50.00	-91.50
		+300		-4.69				-4.71	50.00	-235.25
		+350		-5.30				-5.00	50.00	-249.75
		+400		-0.15				-2.73	50.00	-136.25
		+450		-0.93				-0.54	50.00	-27.00
		+500		-4.90				-2.92	50.00	-145.75
		+550		-3.21				-4.06	50.00	-202.75
		+600		1.74				-0.74	50.00	-36.75
		+650		2.29	2.02	50.00	100.75			
		+700		5.38	3.84	50.00	191.75			
		+750		3.75	4.57	50.00	228.25			
		+800		0.97	2.36	50.00	118.00			
		+850		-5.23				-2.13	50.00	-106.50
		+900		0.07				-2.58	50.00	-129.00
		+950		1.66	0.87	50.00	43.25			
		398km +0		4.42	3.04	50.00	152.00			
		+50		4.55	4.49	50.00	224.25			
		+100		2.65	3.60	50.00	180.00			
		+150		-0.33	1.16	50.00	58.00			
		+200		-3.20				-1.77	50.00	-88.25
		+250		-4.95				-4.08	50.00	-203.75
		+300		-2.58				-3.77	50.00	-188.25
		+350		-3.70				-3.14	50.00	-157.00
		+400		-5.40				-4.55	50.00	-227.50
		+450		-0.25				-2.83	50.00	-141.25
		+500		6.59	3.17	50.00	158.50			
		+550		9.48	8.04	50.00	401.75			
		+600		4.20	6.84	50.00	342.00			
		+650		6.39	5.30	50.00	264.75			
		+700		0.27	3.33	50.00	166.50			
		+750		-0.88				-0.31	50.00	-15.25
		+800		-2.74				-1.81	50.00	-90.50
		+850		-6.21				-4.48	50.00	-223.75
		+900		-4.17				-5.19	50.00	-259.50
		+950		-3.90				-4.04	50.00	-201.75
		399km +0		6.12	1.11	50.00	55.50			
		+50		7.13	6.63	50.00	331.25			
		+100		1.52	4.33	50.00	216.25			
		+150		0.84	1.18	50.00	59.00			
		+200		-2.25				-0.71	50.00	-35.25
		+250		-6.12				-4.19	50.00	-209.25
		+300		-6.57				-6.35	50.00	-317.25
		+350		-1.97				-4.27	50.00	-213.50
		+400		0.76				-0.61	50.00	-30.25
		+450		-2.06				-0.65	50.00	-32.50

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km	ntang	FillorCut	Fill worker			Cut worker			
			hulu	h(m)	(h1+h2)/2	L(m)	h*L(m)	(h1+h2)/2	L(m)	h*L(m)	
			+500		0.68				-0.69	50.00	-34.50
			+550		2.42	1.55	50.00	77.50			
			+600		-0.48	0.97	50.00	48.50			
			+650		0.16				-0.16	50.00	-8.00
			+700		-2.23				-1.04	50.00	-51.75
			+750		-0.21				-1.22	50.00	-61.00
			+800		-0.93				-0.57	50.00	-28.50
			+850		-5.62				-3.28	50.00	-163.75
			+900		-0.71				-3.17	50.00	-158.25
			+950		-0.99				-0.85	50.00	-42.50
		400km	+0		-0.69				-0.84	50.00	-42.00
			+50		0.21				-0.24	50.00	-12.00
			+100		0.41	0.31	50.00	15.50			
			+150		-1.92				-0.76	50.00	-37.75
			+200		0.12				-0.90	50.00	-45.00
			+250		-4.90				-2.39	50.00	-119.50
			+300		-3.83				-4.37	50.00	-218.25
			+350		8.52	2.35	50.00	117.25			
			+400		-4.69	1.92	50.00	95.75			
			+450		-6.86				-5.78	50.00	-288.75
			+500		-1.48				-4.17	50.00	-208.50
			+550		-0.61				-1.05	50.00	-52.25
			+600		6.51	2.95	50.00	147.50			
			+650		6.39	6.45	50.00	322.50			
			+700		1.49	3.94	50.00	197.00			
			+750		4.50	3.00	50.00	149.75			
			+800		8.00	6.25	50.00	312.50			
			+850		-3.44	2.28	50.00	114.00			
			+900		-9.29				-6.37	50.00	-318.25
			+950		-5.48				-7.39	50.00	-369.25
		401km	+0		2.30				-1.59	50.00	-79.50
			+50		3.94	3.12	50.00	156.00			
			+100		4.80	4.37	50.00	218.50			
			+145		4.90	4.85	45.00	218.25			
			+146								
	935	401km	+161	30	Dd.rk.ttp						
			+176								
			+177		5.25						
			+200		5.25	5.25	23.00	120.75			
			+250		4.04	4.65	50.00	232.25			
			+300		4.70	4.37	50.00	218.50			
			+350		-3.72	0.49	50.00	24.50			
			+400		1.05				-1.34	50.00	-66.75
			+450		-4.04				-1.50	50.00	-74.75
			+500		-2.65				-3.35	50.00	-167.25
			+550		-1.60				-2.13	50.00	-106.25
			+600		1.45				-0.08	50.00	-3.75
			+650		-0.77	0.34	50.00	17.00			
			+700		2.50	0.87	50.00	43.25			
			+750		2.70	2.60	50.00	130.00			
			+800		1.72	2.21	50.00	110.50			
			+850		0.56	1.14	50.00	57.00			
			+900		3.56	2.06	50.00	103.00			
			+950		-2.45	0.56	50.00	27.75			
		402km	+0		2.57	0.06	50.00	3.00			
			+50		-1.70	0.44	50.00	21.75			
			+100		3.87	1.09	50.00	54.25			
			+150		-0.78	1.55	50.00	77.25			
			+200		-2.83				-1.81	50.00	-90.25
			+250		-4.64				-3.74	50.00	-186.75
			+300		-4.13				-4.39	50.00	-219.25
			+350		-5.81				-4.97	50.00	-248.50
			+400		-3.10				-4.46	50.00	-222.75
			+450		6.12	1.51	50.00	75.50			
			+500		5.42	5.77	50.00	288.50			
			+550		4.93	5.18	50.00	258.75			

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km	ntang	FillorCut	Fill worker			Cut worker			
			hulu	h(m)	(h1+h2)/2	L(m)	h-L(m)	(h1+h2)/2	L(m)	h-L(m)	
			+600		4.72	4.83	50.00	241.25			
			+650		4.44	4.58	50.00	229.00			
			+700		0.26	2.35	50.00	117.50			
			+750		-4.73				-2.24	50.00	-111.75
			+800		-5.22				-4.98	50.00	-248.75
			+850		-4.38				-4.80	50.00	-240.00
			+900		4.08				-0.15	50.00	-7.50
			+950		-1.39	1.35	50.00	67.25			
		403km	+0		5.34	1.98	50.00	98.75			
			+50		4.27	4.81	50.00	240.25			
			+100		2.42	3.35	50.00	167.25			
			+150		-0.38	1.02	50.00	51.00			
			+200		-0.87				-0.63	50.00	-31.25
			+250		-1.54				-1.21	50.00	-60.25
			+300		-0.82				-1.18	50.00	-59.00
			+350		-2.27				-1.55	50.00	-77.25
			+400		-2.20				-2.24	50.00	-111.75
			+450		-0.82				-1.51	50.00	-75.50
			+500		3.33	1.26	50.00	62.75			
			+550		-0.72	1.31	50.00	65.25			
			+600		-1.19				-0.96	50.00	-47.75
			+650		5.10	1.96	50.00	97.75			
			+700		1.63	3.37	50.00	168.25			
			+750		0.21	0.92	50.00	46.00			
			+800		-0.61				-0.20	50.00	-10.00
			+850		-2.90				-1.76	50.00	-87.75
			+900		-3.51				-3.21	50.00	-160.25
			+950		-1.56				-2.54	50.00	-126.75
		404km	+0		-1.92				-1.74	50.00	-87.00
			+50		0.49				-0.72	50.00	-35.75
			+100		-1.29				-0.40	50.00	-20.00
			+150		-1.21				-1.25	50.00	-62.50
			+200		-1.31				-1.26	50.00	-63.00
			+250		-0.89				-1.10	50.00	-55.00
			+300		5.56	2.34	50.00	116.75			
			+350		1.27	3.42	50.00	170.75			
			+400		1.21	1.24	50.00	62.00			
			+450		0.12	0.67	50.00	33.25			
			+500		-0.36				-0.12	50.00	-6.00
			+550		-0.63				-0.50	50.00	-24.75
			+600		-1.02				-0.83	50.00	-41.25
			+650		0.19				-0.42	50.00	-20.75
			+700		1.75	0.97	50.00	48.50			
			+750		0.21	0.98	50.00	49.00			
			+800		0.25	0.23	50.00	11.50			
			+850		1.89	1.07	50.00	53.50			
			+900		0.11	1.00	50.00	50.00			
			+950		-0.15				-0.02	50.00	-1.00
		405km	+0		-1.63				-0.89	50.00	-44.50
			+50		-2.41				-2.02	50.00	-101.00
			+100		-3.04				-2.73	50.00	-136.25
			+150		-1.68				-2.36	50.00	-118.00
			+200		3.81	1.07	50.00	53.25			
			+300		3.75	3.78	100.00	378.00			
			+400		3.65	3.70	100.00	370.00			
			+500		3.46	3.56	100.00	355.50			
			+600		3.56	3.51	100.00	351.00			
			+700		3.51	3.54	100.00	353.50			
			+800		2.77	3.14	100.00	314.00			
			+900		2.85	2.81	100.00	281.00			
		406km	+0		-3.90				-0.53	100.00	-52.50
			+100		-1.19				-2.55	100.00	-254.50
			+200		-1.63				-1.41	100.00	-141.00
			+300		5.88	2.13	100.00	212.50			
			+310		5.88	5.88	10.00	58.80			
			+311				Pa.bk.ls				

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT										
No Urut	B H No	Letak Km		ntang hulu	FillorCut h(m)	Fill worker			Cut worker			
						(h1+h2)/2	L(m)	h*L(m)	(h1+h2)/2	L(m)	h*L(m)	
	953	406km	+316	10	Bet.Com							
			+321				Pa,bk,ls					
			+322		5.88							
			+400		1.73	3.81	78.00	296.79				
			+500		-0.34	0.70	100.00	69.50				
			+600		-0.50				-0.42	100.00	-42.00	
			+700		-0.70				-0.60	100.00	-60.00	
			+800		-1.13				-0.92	100.00	-91.50	
Me~Bji				Σ		2.71	5686.00	15403.12	-2.58	5750.00	-14841.50	
Banjarsari Km. 406 + 831												
		406km	+831									
			+900		-2.30				-1.72	100.00	-171.50	
		407km	+0		2.27				-0.01	100.00	-1.50	
			+100		2.51	2.39	100.00	239.00				
			+200		-2.54				-0.02	100.00	-1.50	
			+300		-6.11				-4.33	100.00	-432.50	
			+400		-3.74				-4.93	100.00	-492.50	
			+500		-3.33				-3.54	100.00	-353.50	
			+600		4.35	0.51	100.00	51.00				
			+625		4.35	4.35	25.00	108.75				
			+625				Pa,bk,ls					
	958	407km	+628	6	Bet.bert							
			+631				Pa,bk,ls					
			+631		4.35							
			+700		5.20	4.78	69.00	329.48				
			+800		5.43	5.32	100.00	531.50				
			+900		4.27	4.85	100.00	485.00				
		408km	+0		4.80	4.54	100.00	453.50				
			+100		4.28	4.54	100.00	454.00				
			+200		0.41	2.35	100.00	234.50				
			+300		-4.15				-1.87	100.00	-187.00	
			+400		4.22	0.03	100.00	3.50				
			+500		5.88	5.05	100.00	505.00				
			+600		3.38	4.63	100.00	463.00				
			+700		2.94	3.16	100.00	316.00				
			+800		-1.18	0.88	100.00	88.00				
			+900		-0.99				-1.09	100.00	-108.50	
		409km	+0		-7.53				-4.26	100.00	-426.00	
			+100		-11.59				-9.56	100.00	-956.00	
			+200		-3.65				-7.62	100.00	-762.00	
			+300		9.88	3.12	100.00	311.50				
			+400		-0.73	4.58	100.00	457.50				
			+500		3.53	1.40	100.00	140.00				
			+600		4.99	4.26	100.00	426.00				
			+700		4.11	4.55	100.00	455.00				
			+800		-2.79	0.66	100.00	66.00				
			+900		-3.67				-3.23	100.00	-323.00	
		410km	+0		-2.37				-3.02	100.00	-302.00	
			+100		-0.21				-1.29	100.00	-129.00	
			+200		0.44	0.12	100.00	11.50				
			+300		1.18	0.81	100.00	81.00				
			+400		-5.15				-1.99	100.00	-198.50	
			+500		-5.96				-5.56	100.00	-555.50	
			+600		5.75				-0.11	100.00	-10.50	
			+700		-1.21	2.27	100.00	227.00				
			+800		-5.06				-3.14	100.00	-313.50	
			+900		-2.42				-3.74	100.00	-374.00	
		411km	+0		2.58	0.08	100.00	8.00				
			+100		0.26	1.42	100.00	142.00				
			+200		-0.88				-0.31	100.00	-31.00	
			+300		-1.10				-0.99	100.00	-99.00	
			+400		-1.09				-1.10	100.00	-109.50	
			+500		0.17				-0.46	100.00	-46.00	
			+600		-2.39				-1.11	100.00	-111.00	
			+700		1.58				-0.41	100.00	-40.50	
			+800		3.51	2.55	100.00	254.50				

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km	ntang	FillorCut hulu	Fill worker			Cut worker			
					h(m)	(h1+h2)/2	L(m)	h*L(m)	(h1+h2)/2	L(m)	h*L(m)
		+900		5.42	4.47	100.00	446.50				
		412km +0		3.19	4.31	100.00	430.50				
		+100		1.94	2.57	100.00	256.50				
		+200		0.72	1.33	100.00	133.00				
		+300		1.38	1.05	100.00	105.00				
		+400		0.43	0.91	100.00	90.50				
		+500		-0.05	0.19	100.00	19.00				
		+600		1.52	0.74	100.00	73.50				
		+700		-1.77				-0.13	100.00	-12.50	
		+800		-1.43				-1.60	100.00	-160.00	
		+900		-0.51				-0.97	100.00	-97.00	
		413km +0		0.05				-0.23	100.00	-23.00	
		+100		-0.33				-0.14	100.00	-14.00	
		+200		-0.95				-0.64	100.00	-64.00	
		+300		-0.99				-0.97	100.00	-97.00	
		+400		6.33	2.67	100.00	267.00				
		+500		-1.55	2.39	100.00	239.00				
		+600		-1.64				-1.60	100.00	-159.50	
		+700		-1.58				-1.61	100.00	-161.00	
		+800		-1.16				-1.37	100.00	-137.00	
		+900		-1.32				-1.24	100.00	-124.00	
		414km +0		-0.35				-0.84	100.00	-83.50	
		+100		-1.67				-1.01	100.00	-101.00	
		+200		-2.86				-2.27	100.00	-226.50	
		+300		4.62	0.88	100.00	88.00				
		+400		-2.05	1.29	100.00	128.50				
		+500		5.66	1.81	100.00	180.50				
		+600		-2.29	1.69	100.00	168.50				
		+700		-2.18				-2.24	100.00	-223.50	
		+800		-1.76				-1.97	100.00	-197.00	
		+900		5.61	1.93	100.00	192.50				
		415km +0		-0.01	2.80	100.00	280.00				
		+100		-1.03				-0.52	100.00	-52.00	
		+200		1.12	0.05	100.00	4.50				
		+300		0.26	0.69	100.00	69.00				
		+400		0.55	0.41	100.00	40.50				
		+500		-0.67				-0.06	100.00	-6.00	
		+600		-0.90				-0.79	100.00	-78.50	
		+700		-0.14				-0.52	100.00	-52.00	
		+800		-1.14				-0.64	100.00	-64.00	
		+900		-0.95				-1.05	100.00	-104.50	
		416km +0		-0.34				-0.65	100.00	-64.50	
		+100		-0.28				-0.31	100.00	-31.00	
		+200		-0.20				-0.24	100.00	-24.00	
		+300		-1.38				-0.79	100.00	-79.00	
		+400		-13.50				-7.44	100.00	-744.00	
		+500		1.14				-6.18	100.00	-618.00	
		+600		8.14	4.64	100.00	464.00				
		+700		3.27	5.71	100.00	570.50				
		+800		4.26	3.77	100.00	376.50				
		+891		7.85	6.06	91.00	551.01				
		+892									
987	416km	+902	20	Ras,rk							
		+912									
		+913		7.85							
		417km +0		-0.12	3.87	87.00	336.26				
		+100		3.80	1.84	100.00	184.00				
		+200		0.05	1.93	100.00	192.50				
		+300		6.76	3.41	100.00	340.50				
		+400		-7.00				-0.12	100.00	-12.00	
		+500		0.82				-3.09	100.00	-309.00	
		+600		1.87	1.35	100.00	134.50				
		+700		-0.31	0.78	100.00	78.00				
		+800		-5.61				-2.96	100.00	-296.00	
		+900		-0.01				-2.81	100.00	-281.00	
		418km +0		8.89	4.44	100.00	444.00				

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km	ntang hulu	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h*L(m)	(h1+h2)/2	L(m)	h*L(m)	
				+100	-0.34	4.28	100.00	427.50			
				+200	1.37	0.52	100.00	51.50			
				+300	-9.40				-4.02	100.00	-401.50
				+400	-6.09				-7.75	100.00	-774.50
				+500	-2.65				-4.37	100.00	-437.00
				+600	0.73				-0.96	100.00	-96.00
				+700	1.96	1.35	100.00	134.50			
				+800	1.96	1.96	100.00	196.00			
				+900	4.04	3.00	100.00	300.00			
		419km		+0	-2.38	0.83	100.00	83.00			
				+100	2.40	0.01	100.00	1.00			
				+200	2.11	2.26	100.00	225.50			
				+300	-0.85	0.63	100.00	63.00			
				+400	0.90	0.03	100.00	2.50			
				+500	2.55	1.73	100.00	172.50			
				+600	-1.24	0.66	100.00	65.50			
				+700	-1.46				-1.35	100.00	-135.00
				+800	1.54	0.04	100.00	4.00			
				+812	1.54	1.54	12.00	18.48			
				+813			Pa,bet,sm				
998	419km	+893	60	Dd,rk,ttp							
							Pi,bet,sm				
			40	Dd,rk,ttp							
							Pi,bet,sm				
			30	Dd,rk,ttp							
							Pi,bet,sm				
			30	Dd,rk,ttp							
							Pa,bet,sm				
				+973							
				+974	6.33						
		420km		+0	6.33	6.33	26.00	164.58			
				+100	3.90	5.12	100.00	511.50			
				+200	3.38	3.64	100.00	364.00			
				+300	1.20	2.29	100.00	229.00			
				+400	2.56	1.88	100.00	188.00			
				+500	-3.81				-0.63	100.00	-62.50
				+600	-3.16				-3.49	100.00	-348.50
				+700	-1.36				-2.26	100.00	-226.00
				+800	-0.23				-0.80	100.00	-79.50
				+900	-1.64				-0.94	100.00	-93.50
		421km		+0	-6.04				-3.84	100.00	-384.00
				+100	0.89				-2.58	100.00	-257.50
				+200	-7.52				-3.32	100.00	-331.50
				+300	-4.62				-6.07	100.00	-607.00
				+400	-3.94				-4.28	100.00	-428.00
				+500	-5.81				-4.88	100.00	-487.50
				+600	-5.89				-5.85	100.00	-585.00
				+700	5.19				-0.35	100.00	-35.00
				+800	3.55	4.37	100.00	437.00			
				+900	3.33	3.44	100.00	344.00			
		422km		+0	8.10	5.72	100.00	571.50			
				+100	3.38	5.74	100.00	574.00			
				+200	2.25	2.82	100.00	281.50			
				+300	3.81	3.03	100.00	303.00			
				+400	-2.49	0.66	100.00	66.00			
				+500	-0.51				-1.50	100.00	-150.00
				+600	0.89	0.19	100.00	19.00			
				+700	0.59	0.74	100.00	74.00			
				+800	-0.86				-0.14	100.00	-13.50
				+900	-1.71				-1.29	100.00	-128.50
		423km		+0	-0.18				-0.95	100.00	-94.50
				+100	0.55	0.19	100.00	18.50			
				+200	-0.33	0.11	100.00	11.00			
				+300	-0.79				-0.56	100.00	-56.00
				+400	1.88	0.55	100.00	54.50			
		423km		+500	0.02	0.95	100.00	95.00			
				+600	-0.13				-0.06	100.00	-5.50

DLJ.No.52		LINTAS : PRABUMULIH - LAHAT								
No Urut	B H No	Letak Km	ntang hulu	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h-L(m)	(h1+h2)/2	L(m)	h-L(m)
		Bji~Sct		Σ	2.32	8510.00	19777.56	-2.15	8100.00	-17449.00
		Sukacinta Km. 423 + 632								
		423km +632								
		423km +700		-0.03				-0.08	100.00	-8.00
		+800		-0.21				-0.12	100.00	-12.00
		+900		-0.19				-0.20	100.00	-20.00
		424km +0		2.65	1.23	100.00	123.00			
		+100		-0.92	0.87	100.00	86.50			
		+200		-1.60				-1.26	100.00	-126.00
		+300		2.36	0.38	100.00	38.00			
		+400		-3.98				-0.81	100.00	-81.00
		+500		-1.87				-2.93	100.00	-292.50
		+600		-3.62				-2.75	100.00	-274.50
		+700		5.11	0.75	100.00	74.50			
		+800		3.68	4.40	100.00	439.50			
		+900		2.07	2.88	100.00	287.50			
		425km +0		2.49	2.28	100.00	228.00			
		+100		2.13	2.31	100.00	231.00			
		+200		2.72	2.43	100.00	242.50			
		+300		1.27	2.00	100.00	199.50			
		+400		0.71	0.99	100.00	99.00			
		+500		0.47	0.59	100.00	59.00			
		+600		0.43	0.45	100.00	45.00			
		+700		0.44	0.44	100.00	43.50			
		+800		1.50	0.97	100.00	97.00			
		+900		1.78	1.64	100.00	164.00			
		426km +0		1.56	1.67	100.00	167.00			
		+100		0.67	1.12	100.00	111.50			
		+200		0.77	0.72	100.00	72.00			
		+300		2.49	1.63	100.00	163.00			
		+400		0.73	1.61	100.00	161.00			
		+500		0.90	0.82	100.00	81.50			
		+600		1.77	1.34	100.00	133.50			
		+700		2.21	1.99	100.00	199.00			
		+800		1.36	1.79	100.00	178.50			
		+900		1.53	1.45	100.00	144.50			
		427km +0		4.13	2.83	100.00	283.00			
		Padang Bungatanjung Km. 427 + 000								
		427km +0								
		427km +0		4.13						
		+100		-2.95	0.59	100.00	59.00			
		+200		-1.87				-2.41	100.00	-241.00
		+300		-2.37				-2.12	100.00	-212.00
		+400		-1.77				-2.07	100.00	-207.00
		+500		-0.96				-1.37	100.00	-136.50
		+600		-0.19				-0.58	100.00	-57.50
		+700		1.35	0.58	100.00	58.00			
		+800		-0.11	0.62	100.00	62.00			
		+900		-1.06				-0.59	100.00	-58.50
		428km +0		-1.91				-1.49	100.00	-148.50
		+100		-0.85				-1.38	100.00	-138.00
		+200		2.45	0.80	100.00	80.00			
		+300		-0.12	1.17	100.00	116.50			
		+400		2.74	1.31	100.00	131.00			
		+500		-1.94	0.40	100.00	40.00			
		+600		-1.46				-1.70	100.00	-170.00
		+700		-1.79				-1.63	100.00	-162.50
		+800		-1.81				-1.80	100.00	-180.00
		+900		-2.21				-2.01	100.00	-201.00
		429km +0		3.80	0.80	100.00	79.50			
		+100		3.12	3.46	100.00	346.00			
		+200		1.01	2.07	100.00	206.50			
		+300		0.25	0.63	100.00	63.00			
		+400		3.31	1.78	100.00	178.00			
		+500		-2.01	0.65	100.00	65.00			
		+600		-2.12				-2.07	100.00	-206.50

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)
		+700								
		321km +800		2.06						
		+900		0.31	1.19	100.00	118.50			
		322km +0		3.00	1.66	100.00	165.50			
		+100		2.40	2.70	100.00	270.00			
		+200		-4.10				-0.85	100.00	-85.00
		PRABUMULIH KM. 322 + 295								
		322km +295								
		+300		-1.44				-2.77	100.00	-277.00
		+400		1.73	0.15	100.00	14.50			
		+500		1.44	1.59	100.00	158.50			
		+600		1.41	1.43	100.00	142.50			
		+700		-0.96	0.23	100.00	22.50			
		+800		-1.42				-1.19	100.00	-119.00
		+900		-1.39				-1.41	100.00	-140.50
		323km +0		3.06	0.84	100.00	83.50			
		+100		1.21	2.14	100.00	213.50			
		+200		-1.13	0.04	100.00	4.00			
		+300		-1.47				-1.30	100.00	-130.00
		+400		-1.46				-1.47	100.00	-146.50
		+500		-0.53				-1.00	100.00	-99.50
		+600		2.06	0.77	100.00	76.50			
		+700		3.79	2.93	100.00	292.50			
		+800		3.10	3.45	100.00	344.50			
		+900		0.21	1.66	100.00	165.50			
		324km +0		-1.93				-0.86	100.00	-86.00
		+100		-0.87				-1.40	100.00	-140.00
		+200		1.51	0.32	100.00	32.00			
		+300		4.56	3.04	100.00	303.50			
		+400		1.00	2.78	100.00	278.00			
		+500		-3.58				-1.29	100.00	-129.00
		+600		-5.89				-4.74	100.00	-473.50
		+700		-4.85				-5.37	100.00	-537.00
		+800		1.22				-1.82	100.00	-181.50
		+900		-0.37	0.43	100.00	42.50			
		325km +0		-0.81				-0.59	100.00	-59.00
		+100		-0.69				-0.75	100.00	-75.00
		+200		-0.08				-0.39	100.00	-38.50
		+300		1.57	0.75	100.00	74.50			
		+400		1.87	1.72	100.00	172.00			
		+500		0.02	0.95	100.00	94.50			
		+600		0.56	0.29	100.00	29.00			
		+700		6.84	3.70	100.00	370.00			
		+800		-0.41	3.22	100.00	321.50			
		+900		-2.39				-1.40	100.00	-140.00
		326km +0		-2.90				-2.65	100.00	-264.50
		+100		-3.18				-3.04	100.00	-304.00
		+200		-2.81				-3.00	100.00	-299.50
		+300		-3.33				-3.07	100.00	-307.00
		+400		-4.16				-3.75	100.00	-374.50
		+500		-2.32				-3.24	100.00	-324.00
		+600		-2.88				-2.60	100.00	-260.00
		+700		-1.81				-2.35	100.00	-234.50
		+800		2.47	0.33	100.00	33.00			
		+900		6.72	4.60	100.00	459.50			
		327km +0		1.57	4.15	100.00	414.50			
		+100		-0.52	0.53	100.00	52.50			
		+200		-0.59				-0.56	100.00	-55.50
		+300		-0.64				-0.62	100.00	-61.50
		+400		-0.61				-0.63	100.00	-62.50
		+500		-0.55				-0.58	100.00	-58.00
		+600		0.63	0.04	100.00	4.00			
		+700		-0.53	0.05	100.00	5.00			
		+800		-0.84				-0.69	100.00	-68.50
		+900		-0.32				-0.58	100.00	-58.00

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI									
No Urut	B H No	Letak Km		ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker		
						(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)
		328km	+0		0.49	0.09	100.00	8.50			
			+100		1.69	1.09	100.00	109.00			
			+200		4.41	3.05	100.00	305.00			
			+300		7.04	5.73	100.00	572.50			
			+400		3.62	5.33	100.00	533.00			
			+500		1.08	2.35	100.00	235.00			
			+600		-0.87	0.11	100.00	10.50			
			+700		-2.16				-1.52	100.00	-151.50
			+800		-1.99				-2.08	100.00	-207.50
			+900		0.80				-0.60	100.00	-59.50
		329km	+0		2.09	1.45	100.00	144.50			
			+100		1.64	1.87	100.00	186.50			
			+200		-0.06	0.79	100.00	79.00			
			+300		-0.79				-0.43	100.00	-42.50
			+400		-0.83				-0.81	100.00	-81.00
			+500		-0.23				-0.53	100.00	-53.00
			+600		0.87	0.32	100.00	32.00			
			+700		1.50	1.19	100.00	118.50			
			+800		2.92	2.21	100.00	221.00			
			+900		0.78	1.85	100.00	185.00			
		330km	+0		-0.64	0.07	100.00	7.00			
			+100		-2.63				-1.64	100.00	-163.50
			+200		-2.24				-2.44	100.00	-243.50
			+300		-1.71				-1.98	100.00	-197.50
			+400		-1.47				-1.59	100.00	-159.00
			+500		-1.47				-1.47	100.00	-147.00
			+600		-1.69				-1.58	100.00	-158.00
			+700		-1.50				-1.60	100.00	-159.50
			+800		-2.50				-2.00	100.00	-200.00
			+900		-2.70				-2.60	100.00	-260.00
		331km	+0		-1.19				-1.95	100.00	-194.50
			+100		-0.48				-0.84	100.00	-83.50
			+200		-1.61				-1.05	100.00	-104.50
			+300		-1.89				-1.75	100.00	-175.00
			+400		-1.79				-1.84	100.00	-184.00
			+500		-1.50				-1.65	100.00	-164.50
			+600		-0.31				-0.91	100.00	-90.50
			+700		1.11	0.40	100.00	40.00			
			+800		9.05	5.08	100.00	508.00			
			+900		3.20	6.13	100.00	612.50			
		332km	+0		1.18	2.19	100.00	219.00			
			+100		-0.35	0.42	100.00	41.50			
			+200		-0.48				-0.42	100.00	-41.50
			+300		-0.78				-0.63	100.00	-63.00
			+400		-1.22				-1.00	100.00	-100.00
			+500		-1.86				-1.54	100.00	-154.00
			+600		-0.78				-1.32	100.00	-132.00
			+700		-0.34				-0.56	100.00	-56.00
			+800		-0.11				-0.23	100.00	-22.50
			+900		1.18	0.54	100.00	53.50			
		333km	+0		0.96	1.07	100.00	107.00			
			+100		0.18	0.57	100.00	57.00			
			+200		0.27	0.23	100.00	22.50			
			+300		-0.14	0.07	100.00	6.50			
			+400		-0.25				-0.20	100.00	-19.50
			+500		-0.23				-0.24	100.00	-24.00
			+600		-0.47				-0.35	100.00	-35.00
			+700		-0.41				-0.44	100.00	-44.00
			+800		-0.14				-0.28	100.00	-27.50
			+900		-0.47				-0.31	100.00	-30.50
		334km	+0		-0.40				-0.44	100.00	-43.50
			+100		0.38				-0.01	100.00	-1.00
			+200		0.16	0.27	100.00	27.00			
			+300		-0.90				-0.37	100.00	-37.00
			+400		-0.42				-0.66	100.00	-66.00
			+500		-0.32				-0.37	100.00	-37.00

DLJ.No.51		LINTAS : PRABUMULIH - KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h·L(m)	(h1+h2)/2	L(m)	h·L(m)
		+600		-0.33				-0.33	100.00	-32.50
		+700		-0.60				-0.47	100.00	-46.50
		+800		-0.34				-0.47	100.00	-47.00
		+900		1.61	0.64	100.00	63.50			
		335km +0		-0.32	0.65	100.00	64.50			
		+100		0.20				-0.06	100.00	-6.00
		+200		0.89	0.55	100.00	54.50			
		+300		1.44	1.17	100.00	116.50			
		+400		1.60	1.52	100.00	152.00			
		+500		0.90	1.25	100.00	125.00			
		+600		0.21	0.56	100.00	55.50			
		+700		-0.20	0.00	100.00	0.50			
		+800		-0.15				-0.18	100.00	-17.50
		+900		0.11				-0.02	100.00	-2.00
		336km +0		0.11	0.11	100.00	11.00			
		+100		0.30	0.21	100.00	20.50			
		+200		0.60	0.45	100.00	45.00			
		+300		1.37	0.99	100.00	98.50			
		+400		-0.19	0.59	100.00	59.00			
		+500		-0.84				-0.52	100.00	-51.50
		+600		-0.91				-0.88	100.00	-87.50
		+700		0.75				-0.08	100.00	-8.00
		+800		2.22	1.49	100.00	148.50			
		+900		0.04	1.13	100.00	113.00			
		337km +0		-0.36				-0.16	100.00	-16.00
		+100		-0.52				-0.44	100.00	-44.00
		+200		0.49				-0.02	100.00	-1.50
		+300		0.22	0.36	100.00	35.50			
		+400		0.54	0.38	100.00	38.00			
		+500		-0.18	0.18	100.00	18.00			
		+600		-1.26				-0.72	100.00	-72.00
		+700		-1.06				-1.16	100.00	-116.00
		+800		0.97				-0.05	100.00	-4.50
		+900		2.58	1.78	100.00	177.50			
		338km +0		-0.98	0.80	100.00	80.00			
		Pbm~Leb		Σ	1.40	7600.00	10676.00	-1.20	8600.00	-10355.00
		L e m b a k Km. 338 + 090								
		338km +90								
		+100		-2.17				-1.58	100.00	-157.50
		+200		-2.67				-2.42	100.00	-242.00
		+300		-2.55				-2.61	100.00	-261.00
		338km +400		-1.35				-1.95	100.00	-195.00
		+500		0.75				-0.30	100.00	-30.00
		+600		4.59	2.67	100.00	267.00			
		+700		4.26	4.43	100.00	442.50			
		+800		1.51	2.89	100.00	288.50			
		+900		-0.97	0.27	100.00	27.00			
		339km +0		-2.38				-1.68	100.00	-167.50
		+100		-2.92				-2.65	100.00	-265.00
		+200		-2.04				-2.48	100.00	-248.00
		+300		0.73				-0.66	100.00	-65.50
		+400		2.26	1.50	100.00	149.50			
		+500		0.82	1.54	100.00	154.00			
		+600		-1.43				-0.31	100.00	-30.50
		+700		-2.29				-1.86	100.00	-186.00
		+800		-1.61				-1.95	100.00	-195.00
		+900		0.33				-0.64	100.00	-64.00
		340km +0		3.34	1.84	100.00	183.50			
		+100		1.05	2.20	100.00	219.50			
		+200		0.20	0.63	100.00	62.50			
		+300		-0.62				-0.21	100.00	-21.00
		+400		-0.55				-0.59	100.00	-58.50
		+500		0.04				-0.26	100.00	-25.50
		+600		0.42	0.23	100.00	23.00			
		+700		-0.44				-0.01	100.00	-1.00
		+800		-0.80				-0.62	100.00	-62.00

DLJ.No.51		LINTAS : PRABUMULIH - KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h·L(m)	(h1+h2)/2	L(m)	h·L(m)
		+900		-0.72				-0.76	100.00	-76.00
		341km +0		-0.16				-0.44	100.00	-44.00
		+100		-0.63				-0.40	100.00	-39.50
		+200		-1.01				-0.82	100.00	-82.00
		+300		-0.91				-0.96	100.00	-96.00
		+400		-0.76				-0.84	100.00	-83.50
		+500		-0.02				-0.39	100.00	-39.00
		+600		0.93	0.46	100.00	45.50			
		+700		1.79	1.36	100.00	136.00			
		+800		0.60	1.20	100.00	119.50			
		+900		0.71	0.66	100.00	65.50			
		342km +0		0.68	0.70	100.00	69.50			
		+100		0.69	0.69	100.00	68.50			
		+200		-0.11	0.29	100.00	29.00			
		+300		-0.63				-0.37	100.00	-37.00
		+400		-0.98				-0.81	100.00	-80.50
		+500		0.13				-0.43	100.00	-42.50
		+600		4.55	2.34	100.00	234.00			
		+700		4.79	4.67	100.00	467.00			
		+800		0.64	2.72	100.00	271.50			
		+900		-0.22	0.21	100.00	21.00			
		343km +0		-0.51				-0.37	100.00	-36.50
		+100		-0.79				-0.65	100.00	-65.00
		+200		-0.62				-0.71	100.00	-70.50
		+300		-0.85				-0.74	100.00	-73.50
		+400		-1.14				-1.00	100.00	-99.50
		+500		-1.04				-1.09	100.00	-109.00
		+600		-1.13				-1.09	100.00	-108.50
		+700		-0.65				-0.89	100.00	-89.00
		+800		0.50				-0.08	100.00	-7.50
		+900		0.69	0.60	100.00	59.50			
		344km +0		-0.08	0.31	100.00	30.50			
		+100		-0.90				-0.49	100.00	-49.00
		+200		-1.03				-0.97	100.00	-96.50
		+300		0.28				-0.38	100.00	-37.50
		+400		4.90	2.59	100.00	259.00			
		+500		2.97	3.94	100.00	393.50			
		+600		0.38	1.68	100.00	167.50			
		+700		-0.51				-0.07	100.00	-6.50
		+800		-1.08				-0.80	100.00	-79.50
		+900		-1.20				-1.14	100.00	-114.00
		345km +0		-1.16				-1.18	100.00	-118.00
		+100		-0.20				-0.68	100.00	-68.00
		+200		3.79	1.80	100.00	179.50			
		+300		0.64	2.22	100.00	221.50			
		+400		-1.51				-0.44	100.00	-43.50
		+500		-2.09				-1.80	100.00	-180.00
		Leb~Keb		Σ	1.66	2800.00	4655.00	-0.92	4700.00	-4346.50
		Karangendah Km. 345 + 549								
		345km +549								
		+600		-1.80				-1.95	100.00	-194.50
		+700		-0.67				-1.24	100.00	-123.50
		+800		1.34	0.34	100.00	33.50			
		345km +900		4.82	3.08	100.00	308.00			
		346km +0		3.26	4.04	100.00	404.00			
		+100		0.98	2.12	100.00	212.00			
		+200		-0.79	0.10	100.00	9.50			
		+300		-1.25				-1.02	100.00	-102.00
		+400		-0.76				-1.01	100.00	-100.50
		+500		-1.96				-1.36	100.00	-136.00
		+600		-2.21				-2.09	100.00	-208.50
		+700		-2.28				-2.25	100.00	-224.50
		+800		-1.82				-2.05	100.00	-205.00
		+900		-1.49				-1.66	100.00	-165.50
		347km +0		-0.96				-1.23	100.00	-122.50
		+100		-0.17				-0.57	100.00	-56.50

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI									
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)	
				1.94	0.89	100.00	88.50				
				1.93	1.94	100.00	193.50				
				0.00	0.97	100.00	96.50				
				-0.65				-0.33	100.00	-32.50	
				-1.60				-1.13	100.00	-112.50	
				-2.12				-1.86	100.00	-186.00	
				-1.92				-2.02	100.00	-202.00	
				-1.31				-1.62	100.00	-161.50	
		348km		+0	-0.70			-1.01	100.00	-100.50	
				+100	0.76	0.03	100.00	3.00			
				+200	4.03	2.40	100.00	239.50			
				+300	-0.51	1.76	100.00	176.00			
				+400	-1.09			-0.80	100.00	-80.00	
				+500	0.72			-0.19	100.00	-18.50	
				+600	2.30	1.51	100.00	151.00			
				+700	-1.02	0.64	100.00	64.00			
				+800	-2.05			-1.54	100.00	-153.50	
				+900	-2.22			-2.14	100.00	-213.50	
		349km		+0	-1.88			-2.05	100.00	-205.00	
				+100	-2.22			-2.05	100.00	-205.00	
				+200	-1.97			-2.10	100.00	-209.50	
				+300	-0.77			-1.37	100.00	-137.00	
				+400	2.51	0.87	100.00	87.00			
				+500	5.71	4.11	100.00	411.00			
				+600	1.18	3.45	100.00	344.50			
				+700	-0.59	0.30	100.00	29.50			
				+800	-1.83			-1.21	100.00	-121.00	
				+900	-2.20			-2.02	100.00	-201.50	
		350km		+0	-1.78			-1.99	100.00	-199.00	
				+100	-0.99			-1.39	100.00	-138.50	
				+200	0.37			-0.31	100.00	-31.00	
				+300	0.19	0.28	100.00	28.00			
				+400	-0.52			-0.17	100.00	-16.50	
				+500	-0.37			-0.45	100.00	-44.50	
				+600	-0.34			-0.36	100.00	-35.50	
				+700	-0.81			-0.58	100.00	-57.50	
				+800	-1.14			-0.98	100.00	-97.50	
				+900	-1.70			-1.42	100.00	-142.00	
		351km		+0	-1.84			-1.77	100.00	-177.00	
				+100	-1.89			-1.87	100.00	-186.50	
				+200	-1.28			-1.59	100.00	-158.50	
				+300	-0.09			-0.69	100.00	-68.50	
				+400	1.76	0.84	100.00	83.50			
				+500	6.32	4.04	100.00	404.00			
				+600	1.31	3.82	100.00	381.50			
				+700	-0.86	0.23	100.00	22.50			
				+800	-1.28			-1.07	100.00	-107.00	
				+900	-0.60			-0.94	100.00	-94.00	
		352km		+0	0.72	0.06	100.00	6.00			
				+100	5.91	3.32	100.00	331.50			
				+200	0.04	2.98	100.00	297.50			
				+300	-1.48			-0.72	100.00	-72.00	
				+400	-1.64			-1.56	100.00	-156.00	
				+500	-1.40			-1.52	100.00	-152.00	
				+600	-1.03			-1.22	100.00	-121.50	
				+700	-0.66			-0.85	100.00	-84.50	
				+800	0.45			-0.11	100.00	-10.50	
				+900	4.21	2.33	100.00	233.00			
		353km		+0	-1.58	1.32	100.00	131.50			
				+100	-2.55			-2.07	100.00	-206.50	
				+200	-2.59			-2.57	100.00	-257.00	
				+300	-1.77			-2.18	100.00	-218.00	
				+400	-2.02			-1.90	100.00	-189.50	
				+500	-2.50			-2.26	100.00	-226.00	
				+600	-1.69			-2.10	100.00	-209.50	
				+700	0.28			-0.71	100.00	-70.50	

DLJ.No.51		LINTAS : PRABUMULIH - KERTAPATI									
No Urut	B H No	Letak Km	ntang	FillorCut	Fill worker			Cut worker			
			hulu	h(m)	(h1+h2)/2	L(m)	h·L(m)	(h1+h2)/2	L(m)	h·L(m)	
		+800		-0.42					-0.07	100.00	-7.00
		Keb~Glb		Σ	1.77	2700.00	4770.00	-1.34	5600.00	-7512.50	
		Glumbang Km. 353 + 833									
		353km	+833								
			+900		-0.22				-0.32	100.00	-32.00
		354km	+0		-0.27				-0.25	100.00	-24.50
			+100		-0.18				-0.23	100.00	-22.50
			+200		-0.35				-0.27	100.00	-26.50
			+300		-0.06				-0.21	100.00	-20.50
			+400		0.07	0.01	100.00	0.50			
			+500		1.00	0.54	100.00	53.50			
			+600		0.92	0.96	100.00	96.00			
			+700		0.44	0.68	100.00	68.00			
			+800		-1.46				-0.51	100.00	-51.00
			+900		-2.18				-1.82	100.00	-182.00
		355km	+0		-2.29				-2.24	100.00	-223.50
			+100		-2.23				-2.26	100.00	-226.00
			+200		-1.67				-1.95	100.00	-195.00
			+300		-0.29				-0.98	100.00	-98.00
			+400		4.38	2.05	100.00	204.50			
			+500		0.64	2.51	100.00	251.00			
			+600		-0.70				-0.03	100.00	-3.00
			+700		-1.31				-1.01	100.00	-100.50
			+800		-1.32				-1.32	100.00	-131.50
			+900		-1.72				-1.52	100.00	-152.00
		356km	+0		-1.88				-1.80	100.00	-180.00
			+100		0.59				-0.65	100.00	-64.50
			+200		0.74	0.67	100.00	66.50			
			+300		-1.65				-0.46	100.00	-45.50
			+400		-1.77				-1.71	100.00	-171.00
			+500		-1.27				-1.52	100.00	-152.00
			+600		-0.68				-0.98	100.00	-97.50
			+700		-0.67				-0.68	100.00	-67.50
			+800		-0.90				-0.79	100.00	-78.50
			+900		-0.80				-0.85	100.00	-85.00
		357km	+0		-0.60				-0.70	100.00	-70.00
			+100		-0.87				-0.74	100.00	-73.50
			+200		-1.20				-1.04	100.00	-103.50
			+300		-1.88				-1.54	100.00	-154.00
			+400		-2.43				-2.16	100.00	-215.50
			+500		-2.37				-2.40	100.00	-240.00
			+600		-1.80				-2.09	100.00	-208.50
			+700		-1.02				-1.41	100.00	-141.00
			+800		0.74				-0.14	100.00	-14.00
			+900		0.37	0.56	100.00	55.50			
		358km	+0		1.07	0.72	100.00	72.00			
			+100		5.28	3.18	100.00	317.50			
			+200		-0.44	2.42	100.00	242.00			
			+300		-3.38				-1.91	100.00	-191.00
			+400		-4.17				-3.78	100.00	-377.50
			+500		-2.90				-3.54	100.00	-353.50
			+600		-1.13				-2.02	100.00	-201.50
			+700		2.48	0.68	100.00	67.50			
			+800		3.98	3.23	100.00	323.00			
			+867		4.40	4.19	66.50	278.64			
			+868				Pa.bk.l.s				
686	358km	+875	15	Ras.dl							
		+883					Pa.bk.l.s				
		+884		4.40							
		+900		4.40	4.40	16.50	72.60				
		359km	+0		2.06	3.23	100.00	323.00			
			+100		-1.02	0.52	100.00	52.00			
			+200		-2.47				-1.75	100.00	-174.50
			+300		-2.45				-2.46	100.00	-246.00
			+400		-0.24				-1.35	100.00	-134.50
			+500		3.84	1.80	100.00	180.00			

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI								
No Urut	B H No	Letak Km	ntang	FillorCut	Fill worker			Cut worker		
			hulu	h(m)	(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)
		+600		-0.32	1.76	100.00	176.00			
		+700		-0.74				-0.53	100.00	-53.00
		+800		-0.57				-0.66	100.00	-66.00
		+900		-0.56				-0.57	100.00	-57.00
		360km +0		-0.69				-0.63	100.00	-63.00
		+100		-0.55				-0.62	100.00	-62.00
		+200		0.40				-0.08	100.00	-7.50
		+300		-0.83				-0.22	100.00	-21.50
		+400		-1.36				-1.10	100.00	-109.50
		+500		-1.90				-1.63	100.00	-163.00
		+600		-1.61				-1.76	100.00	-175.50
		+700		-1.22				-1.42	100.00	-141.50
		+800		-0.75				-0.99	100.00	-98.50
		+900		-0.76				-0.76	100.00	-75.50
		361km +0		-0.66				-0.71	100.00	-71.00
		+100		-0.14				-0.40	100.00	-40.00
		+200		0.26	0.06	100.00	6.00			
		+300		-0.90				-0.32	100.00	-32.00
		+400		-0.79				-0.85	100.00	-84.50
		+500		-0.70				-0.75	100.00	-74.50
		+600		-0.84				-0.77	100.00	-77.00
		+700		-0.82				-0.83	100.00	-83.00
		+800		-1.89				-1.36	100.00	-135.50
		+900		-2.53				-2.21	100.00	-221.00
		362km +0		-2.60				-2.57	100.00	-256.50
		+100		-2.07				-2.34	100.00	-233.50
		+200		-2.08				-2.08	100.00	-207.50
		+300		-0.50				-1.29	100.00	-129.00
		+400		1.38	0.44	100.00	44.00			
		+500		5.03	3.21	100.00	320.50			
		+600		1.86	3.45	100.00	344.50			
		+700		2.02	1.94	100.00	194.00			
		+800		0.30	1.16	100.00	116.00			
		+900		-0.62				-0.16	100.00	-16.00
		363km +0		-1.21				-0.92	100.00	-91.50
		+100		-1.25				-1.23	100.00	-123.00
		+200		-0.39				-0.82	100.00	-82.00
		+300		2.32	0.97	100.00	96.50			
		363km +400		0.45	1.39	100.00	138.50			
		Glb~Sbn		Σ	1.61	2583.00	4159.74	-1.20	7000.00	-8378.00
		Serdang Km. 363 + 479								
		363km +479								
		+500		-0.40	0.03	100.00	2.50			
		+600		-2.33				-1.37	100.00	-136.50
		363km +700		-2.78				-2.56	100.00	-255.50
		+800		-1.23				-2.01	100.00	-200.50
		+900		0.81				-0.21	100.00	-21.00
		364km +0		3.15	1.98	100.00	198.00			
		+100		-1.30	0.93	100.00	92.50			
		+200		-2.92				-2.11	100.00	-211.00
		+300		-3.17				-3.05	100.00	-304.50
		+400		-2.80				-2.99	100.00	-298.50
		+500		-1.90				-2.35	100.00	-235.00
		+600		0.73				-0.59	100.00	-58.50
		+700		4.83	2.78	100.00	278.00			
		+800		7.32	6.08	100.00	607.50			
		+900		7.11	7.22	100.00	721.50			
		365km +0		5.26	6.19	100.00	618.50			
		+100		2.41	3.84	100.00	383.50			
		+200		0.19	1.30	100.00	130.00			
		+300		-0.99				-0.40	100.00	-40.00
		+400		-2.33				-1.66	100.00	-166.00
		+500		-3.61				-2.97	100.00	-297.00
		+600		-3.95				-3.78	100.00	-378.00
		+700		-3.17				-3.56	100.00	-356.00
		+800		-2.20				-2.69	100.00	-268.50

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)
		366km	+900	-1.93				-2.07	100.00	-206.50
			+0	-1.80				-1.87	100.00	-186.50
			+100	-1.30				-1.55	100.00	-155.00
			+200	0.38				-0.46	100.00	-46.00
			+300	0.41	0.40	100.00	39.50			
			+400	-0.97				-0.28	100.00	-28.00
			+500	-0.15				-0.56	100.00	-56.00
			+600	0.51	0.18	100.00	18.00			
			+700	-0.50	0.01	100.00	0.50			
		+800	-0.99				-0.75	100.00	-74.50	
		+900	-1.47				-1.23	100.00	-123.00	
		367km	+0	-1.33				-1.40	100.00	-140.00
			+100	0.44				-0.45	100.00	-44.50
			+200	-0.44	0.00	100.00	0.00			
			+300	-1.00				-0.72	100.00	-72.00
			+400	-0.72				-0.86	100.00	-86.00
			+500	-0.06				-0.39	100.00	-39.00
			+600	0.60	0.27	100.00	27.00			
			+700	0.85	0.73	100.00	72.50			
			+800	-1.12				-0.14	100.00	-13.50
		+900	-1.96				-1.54	100.00	-154.00	
		368km	+0	-2.44				-2.20	100.00	-220.00
			+100	-2.67				-2.56	100.00	-255.50
			+200	-3.07				-2.87	100.00	-287.00
			+300	-2.39				-2.73	100.00	-273.00
			+400	-0.61				-1.50	100.00	-150.00
			+500	4.27	1.83	100.00	183.00			
			+600	3.40	3.84	100.00	383.50			
			+700	0.98	2.19	100.00	219.00			
			+800	-2.93				-0.98	100.00	-97.50
		+900	-3.43				-3.18	100.00	-318.00	
		369km	+0	-3.16				-3.30	100.00	-329.50
			+100	-2.82				-2.99	100.00	-299.00
			+200	-1.41				-2.12	100.00	-211.50
			+300	-0.84				-1.13	100.00	-112.50
			+400	-0.27				-0.56	100.00	-55.50
			+500	-0.33				-0.30	100.00	-30.00
			+600	-0.56				-0.45	100.00	-44.50
			+700	-0.78				-0.67	100.00	-67.00
			+800	-1.33				-1.06	100.00	-105.50
		+900	-1.05				-1.19	100.00	-119.00	
		370km	+0	-0.40				-0.73	100.00	-72.50
			+100	-0.35				-0.38	100.00	-37.50
			+200	-0.77				-0.56	100.00	-56.00
			+300	-0.88				-0.83	100.00	-82.50
			+400	-0.79				-0.84	100.00	-83.50
			+500	1.51	0.36	100.00	36.00			
			+600	2.51	2.01	100.00	201.00			
			+700	-0.01	1.25	100.00	125.00			
			+800	-1.49				-0.75	100.00	-75.00
		+900	-2.59				-2.04	100.00	-204.00	
		371km	+0	-2.68				-2.64	100.00	-263.50
			+100	-0.91				-1.80	100.00	-179.50
			+200	0.74				-0.09	100.00	-8.50
			+300	1.51	1.13	100.00	112.50			
			+400	-1.01	0.25	100.00	25.00			
			+500	-1.76				-1.39	100.00	-138.50
			+600	-0.25				-1.01	100.00	-100.50
			+700	1.67	0.71	100.00	71.00			
			+800	1.58	1.63	100.00	162.50			
		+900	-0.51	0.54	100.00	53.50				
		372km	+0	-2.36				-1.44	100.00	-143.50
			+100	-0.89				-1.63	100.00	-162.50
			+200	2.81	0.96	100.00	96.00			
			+300	-1.82	0.50	100.00	49.50			
			+400	-1.99				-1.91	100.00	-190.50

DLJ.No.51		LINTAS : PRABUMULIH - KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h·L(m)	(h1+h2)/2	L(m)	h·L(m)
		+500		-1.93				-1.96	100.00	-196.00
		+600		-1.44				-1.69	100.00	-168.50
		+700		0.16				-0.64	100.00	-64.00
		+800		-0.77				-0.31	100.00	-30.50
		+900		0.12				-0.33	100.00	-32.50
		373km +0		1.23	0.68	100.00	67.50			
		+100		1.01	1.12	100.00	112.00			
		+200		-1.48				-0.24	100.00	-23.50
		+300		-2.56				-2.02	100.00	-202.00
		Sbn~Pyk		Σ	1.70	3000.00	5086.50	-1.47	6900.00	-10141.00
		Payakabung Km. 373 + 335								
		373km +335								
		+400		-2.41				-2.49	100.00	-248.50
		+500		-1.88				-2.15	100.00	-214.50
		373km +600		-1.01				-1.45	100.00	-144.50
		+700		-0.74				-0.88	100.00	-87.50
		+800		-0.44				-0.59	100.00	-59.00
		+900		1.23	0.40	100.00	39.50			
		374km +0		4.39	2.81	100.00	281.00			
		+100		-1.00	1.70	100.00	169.50			
		+200		-3.06				-2.03	100.00	-203.00
		+300		-3.32				-3.19	100.00	-319.00
		+400		-3.01				-3.17	100.00	-316.50
		+500		-0.14				-1.58	100.00	-157.50
		+600		2.64	1.25	100.00	125.00			
		+700		2.13	2.39	100.00	238.50			
		+800		-0.41	0.86	100.00	86.00			
		+900		-2.36				-1.39	100.00	-138.50
		375km +0		-1.49				-1.93	100.00	-192.50
		+100		2.02	0.27	100.00	26.50			
		+200		1.62	1.82	100.00	182.00			
		+300		-0.55	0.54	100.00	53.50			
		+400		-1.61				-1.08	100.00	-108.00
		+500		-1.66				-1.64	100.00	-163.50
		+600		-3.38				-2.52	100.00	-252.00
		+700		-2.58				-2.98	100.00	-298.00
		+800		-1.24				-1.91	100.00	-191.00
		+900		-2.30				-1.77	100.00	-177.00
		376km +0		-2.14				-2.22	100.00	-222.00
		+100		1.11				-0.52	100.00	-51.50
		+200		5.34	3.23	100.00	322.50			
		+300		5.68	5.51	100.00	551.00			
		+400		3.93	4.81	100.00	480.50			
		+500		-3.27	0.33	100.00	33.00			
		+600		-4.92				-4.10	100.00	-409.50
		+700		-3.28				-4.10	100.00	-410.00
		+800		-0.63				-1.96	100.00	-195.50
		+900		-1.08				-0.86	100.00	-85.50
		377km +0		-2.36				-1.72	100.00	-172.00
		+100		-2.40				-2.38	100.00	-238.00
		+200		-1.75				-2.08	100.00	-207.50
		+300		-0.88				-1.32	100.00	-131.50
		+400		0.20				-0.34	100.00	-34.00
		+500		1.01	0.61	100.00	60.50			
		+600		1.23	1.12	100.00	112.00			
		+700		-0.43	0.40	100.00	40.00			
		+800		-0.82				-0.63	100.00	-62.50
		+900		-0.62				-0.72	100.00	-72.00
		378km +0		0.39				-0.12	100.00	-11.50
		+100		-0.06	0.17	100.00	16.50			
		+200		-0.71				-0.39	100.00	-38.50
		+300		-0.76				-0.74	100.00	-73.50
		+400		-1.00				-0.88	100.00	-88.00
		+500		-0.74				-0.87	100.00	-87.00
		+600		0.21				-0.27	100.00	-26.50
		+700		1.30	0.76	100.00	75.50			

DLJ.No.51		LINTAS : PRABUMULIH - KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h·L(m)	(h1+h2)/2	L(m)	h·L(m)
		+800		2.78	2.04	100.00	204.00			
		+900		1.99	2.39	100.00	238.50			
		379km +0		2.27	2.13	100.00	213.00			
		+100		2.70	2.49	100.00	248.50			
		+200		1.91	2.31	100.00	230.50			
		+300		1.65	1.78	100.00	178.00			
		+400		1.12	1.39	100.00	138.50			
		+500		1.47	1.30	100.00	129.50			
		+600		2.23	1.85	100.00	185.00			
		+700		2.20	2.22	100.00	221.50			
		+800		2.85	2.53	100.00	252.50			
		+900		1.91	2.38	100.00	238.00			
		380km +0		2.71	2.31	100.00	231.00			
		+100		2.35	2.53	100.00	253.00			
		+200		2.33	2.34	100.00	234.00			
		+300		3.18	2.76	100.00	275.50			
		+400		2.55	2.87	100.00	286.50			
		+500		2.55	2.55	100.00	255.00			
		+600		1.56	2.06	100.00	205.50			
		+700		1.78	1.67	100.00	167.00			
		+800		2.48	2.13	100.00	213.00			
		+900		1.70	2.09	100.00	209.00			
		381km +0		1.84	1.77	100.00	177.00			
		+100		2.55	2.20	100.00	219.50			
		+200		2.73	2.64	100.00	264.00			
		+300		2.76	2.75	100.00	274.50			
		+400		2.67	2.72	100.00	271.50			
		+500		2.06	2.37	100.00	236.50			
		+600		1.45	1.76	100.00	175.50			
		+700		1.27	1.36	100.00	136.00			
		+800		1.30	1.29	100.00	128.50			
		+900		1.25	1.28	100.00	127.50			
		382km +0		0.84	1.05	100.00	104.50			
		+100		1.18	1.01	100.00	101.00			
		+200		1.56	1.37	100.00	137.00			
		+300		2.07	1.82	100.00	181.50			
		+320		2.07	2.07	20.00	41.40			
		+321				Pa,bk,ls				
	714	382km +325	8	Ras,dl						
		+329				Pa,bk,ls				
		+330		2.07						
		+400		2.07	2.07	70.00	144.90			
		+500		1.55	1.81	100.00	181.00			
		+600		0.88	1.22	100.00	121.50			
		+700		1.04	0.96	100.00	96.00			
		+800		1.09	1.07	100.00	106.50			
		+900		1.04	1.07	100.00	106.50			
		383km +0		1.89	1.47	100.00	146.50			
		+100		2.08	1.99	100.00	198.50			
		+114		2.08	2.08	13.75	28.60			
		+115				Pa,bk,ls				
	715	383km +121	12.5	Ras,dl						
		+127				Pa,bk,ls				
		+128		2.08						
		+200		2.95	2.52	71.75	180.45			
		+300		1.82	2.39	100.00	238.50			
		+400		1.58	1.70	100.00	170.00			
		+500		0.40	0.99	100.00	99.00			
		+600		0.23	0.32	100.00	31.50			
		+700		1.41	0.82	100.00	82.00			
		+800		2.21	1.81	100.00	181.00			
		+827		2.21	2.21	26.50	58.57			
		+828				Pa,bk,ls				
	716	383km +835	15	Dind,pel						
		+843				Pa,bk,ls				
		+844		2.90						

DLJ.No.51		LINTAS : PRABUMULIH - KERTAPATI								
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker		
					(h1+h2)/2	L(m)	h·L(m)	(h1+h2)/2	L(m)	h·L(m)
		+900		2.37	2.64	56.50	148.88			
		384km +0		1.87	2.12	100.00	212.00			
		+100		1.67	1.77	100.00	177.00			
		+200		1.10	1.39	100.00	138.50			
		+300		1.26	1.18	100.00	118.00			
		+400		1.65	1.46	100.00	145.50			
		+500		1.46	1.56	100.00	155.50			
		+600		1.47	1.47	100.00	146.50			
		+700		1.38	1.43	100.00	142.50			
		+800		1.29	1.34	100.00	133.50			
		+900		1.17	1.23	100.00	123.00			
		385km +0		1.09	1.13	100.00	113.00			
		+100		1.17	1.13	100.00	113.00			
		+200		0.98	1.08	100.00	107.50			
		+300		0.81	0.90	100.00	89.50			
		+400		1.46	1.14	100.00	113.50			
		+500		1.17	1.32	100.00	131.50			
		+600		1.84	1.51	100.00	150.50			
		+700		2.52	2.18	100.00	218.00			
		+746		2.38	2.45	46.00	112.70			
		+747				Pa,bk,ls				
717	385km	+753	12	Dind.pel						
		+759				Pa,bk,ls				
		+760		2.38						
		+800		2.15	2.27	40.00	90.60			
		+900		1.42	1.79	100.00	178.50			
		386km +0		1.47	1.45	100.00	144.50			
		+100		1.27	1.37	100.00	137.00			
		+200		1.19	1.23	100.00	123.00			
		+300		1.22	1.21	100.00	120.50			
		+400		2.03	1.63	100.00	162.50			
		+500		1.53	1.78	100.00	178.00			
		+600		1.27	1.40	100.00	140.00			
		+700		1.05	1.16	100.00	116.00			
		+800		1.27	1.16	100.00	116.00			
		+900		1.86	1.57	100.00	156.50			
		387km +0		2.28	2.07	100.00	207.00			
		+17		2.28	2.28	17.00	38.76			
		+18				Pa,bk,ls				
718	387km	+38	40	Dd.rk.ttp						
		+58				Pa,bk,ls				
		+59		2.46						
		+100		2.46	2.46	41.00	100.86			
		+200		2.26	2.36	100.00	236.00			
		+300		1.75	2.01	100.00	200.50			
		+400		1.74	1.75	100.00	174.50			
		+500		1.61	1.68	100.00	167.50			
		+600		1.53	1.57	100.00	157.00			
		+700		1.94	1.74	100.00	173.50			
		+800		1.84	1.89	100.00	189.00			
		+900		1.15	1.50	100.00	149.50			
		388km +0		1.31	1.23	100.00	123.00			
		+100		1.36	1.34	100.00	133.50			
		+200		1.12	1.24	100.00	124.00			
		+300		1.01	1.07	100.00	106.50			
		+400		1.17	1.09	100.00	109.00			
		Pyk~Sig		Σ	1.69	11402.50	19290.22	-1.64	3600.00	-5887.00
		Simpang Km. 388 + 500								
		388km +500		1.04	0.52	100.00	52.00			
		+600		1.19	1.12	100.00	111.50			
		+700		1.26	1.23	100.00	122.50			
		+800		1.00	1.13	100.00	113.00			
		+900		1.31	1.16	100.00	115.50			
		389km +0		1.59	1.45	100.00	145.00			
		+100		1.34	1.47	100.00	146.50			
		+200		1.72	1.53	100.00	153.00			

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI									
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)	
		+300		1.53	1.63	100.00	162.50				
		+400		1.29	1.41	100.00	141.00				
		+500		0.97	1.13	100.00	113.00				
		+600		1.11	1.04	100.00	104.00				
		+700		2.24	1.68	100.00	167.50				
		+800		1.83	2.04	100.00	203.50				
		+867		2.26	2.05	67.00	137.02				
		+868									
	720	389km	+872	8	Ras.di						
			+876								
			+877		2.26						
			+900		1.83	2.05	23.00	47.04			
		390km	+0		1.60	1.72	100.00	171.50			
			+100		1.53	1.57	100.00	156.50			
			+200		1.38	1.46	100.00	145.50			
			+300		1.25	1.32	100.00	131.50			
			+400		0.96	1.11	100.00	110.50			
			+500		1.37	1.17	100.00	116.50			
			+600		1.52	1.45	100.00	144.50			
			+700		2.04	1.78	100.00	178.00			
			+779		2.58	2.31	79.00	182.49			
			+780								
			+780								
	721	390km	+786	12	Dind.pel						
			+792								
			+793		2.58						
			+900		2.08	2.33	107.00	249.31			
		391km	+0		1.56	1.82	100.00	182.00			
			+100		1.01	1.29	100.00	128.50			
			+200		1.27	1.14	100.00	114.00			
			+300		1.07	1.17	100.00	117.00			
			+400		0.80	0.94	100.00	93.50			
			+500		0.90	0.85	100.00	85.00			
			+600		1.00	0.95	100.00	95.00			
			+700		1.33	1.17	100.00	116.50			
			+800		1.31	1.32	100.00	132.00			
			+900		0.94	1.13	100.00	112.50			
		392km	+0		1.07	1.01	100.00	100.50			
			+100		1.34	1.21	100.00	120.50			
			+200		1.58	1.46	100.00	146.00			
			+300		1.65	1.62	100.00	161.50			
			+400		1.13	1.39	100.00	139.00			
			+500		1.30	1.22	100.00	121.50			
			+600		1.58	1.44	100.00	144.00			
			+700		2.10	1.84	100.00	184.00			
			+754		2.10	2.10	54.00	113.40			
			+755								
			+755								
	722	392km	+765	20	Dind.pel						
			+775								
			+776		2.10						
			+800		2.14	2.12	24.00	50.88			
			+900		1.81	1.98	100.00	197.50			
		393km	+0		1.31	1.56	100.00	156.00			
			+100		1.15	1.23	100.00	123.00			
			+200		1.11	1.13	100.00	113.00			
			+300		1.07	1.09	100.00	109.00			
			+400		1.36	1.22	100.00	121.50			
			+500		1.95	1.66	100.00	165.50			
			+602		2.31	2.13	102.00	217.26			
			+603								
			+603								
	723	393km	+609	12	Ras.di						
			+615								
			+616		2.31						
			+700		2.05	2.18	84.00	183.12			
			+800		1.50	1.78	100.00	177.50			
			+900		1.29	1.40	100.00	139.50			
		394km	+0		1.26	1.28	100.00	127.50			

DLJ.No.51		LINTAS : PRABUMULIH – KERTAPATI									
No Urut	B H No	Letak Km	ntang (hulu)	FillorCut h(m)	Fill worker			Cut worker			
					(h1+h2)/2	L(m)	h•L(m)	(h1+h2)/2	L(m)	h•L(m)	
		+100		1.71	1.49	100.00	148.50				
		+200		2.14	1.93	100.00	192.50				
		+254		1.99	2.07	54.00	111.51				
		+255				Pa,bk,ls					
724	394km	+259	8	Ras,dl							
		+263				Pa,bk,ls					
		+264		1.99							
		+300		1.99	1.99	36.00	71.64				
		+400		2.06	2.03	100.00	202.50				
		+500		2.15	2.11	100.00	210.50				
		+600		2.22	2.19	100.00	218.50				
		+700		1.93	2.08	100.00	207.50				
		+749		2.56	2.25	48.50	108.88				
		+750				Pa,bk,ls					
725	394km	+757	15	Ras,dl							
		+765				Pa,bk,ls					
		+766		2.56							
		+800		2.08	2.32	34.50	80.04				
		+900		1.81	1.95	100.00	194.50				
	395km	+0		1.38	1.60	100.00	159.50				
		+100		1.40	1.39	100.00	139.00				
		+200		1.48	1.44	100.00	144.00				
		+300		1.33	1.41	100.00	140.50				
		+400		1.59	1.46	100.00	146.00				
		+500		2.03	1.81	100.00	181.00				
		+566		2.21	2.12	65.50	138.86				
		+567				Pa,bk,ls					
726	395km	+574	15	Dind,pel							
		+582				Pa,bk,ls					
		+583		2.22							
		+600		2.22	2.22	17.50	38.85				
		+700		1.81	2.02	100.00	201.50				
		+800		1.27	1.54	100.00	154.00				
		+900		1.47	1.37	100.00	137.00				
	396km	+0		1.38	1.43	100.00	142.50				
		+100		1.62	1.50	100.00	150.00				
		+187		1.68	1.65	87.00	143.55				
		+188				Pa,bk,ls					
727	396km	+192	8	Ras,dl							
		+196				Pa,bk,ls					
		+197		1.68							
		+300		1.60	1.64	103.00	168.92				
		+400		1.31	1.46	100.00	145.50				
		+500		1.23	1.27	100.00	127.00				
		+600		1.34	1.29	100.00	128.50				
		+700		1.24	1.29	100.00	129.00				
		+800		1.27	1.26	100.00	125.50				
		+900		1.33	1.30	100.00	130.00				
	397km	+0		1.75	1.54	100.00	154.00				
		+42		1.75	1.75	42.00	73.50				
		+43				Pa,bk,ls					
728	397km	+47	8	Ras,dl							
		+51				Pa,bk,ls					
		+52		1.75							
		+100		2.06	1.91	48.00	91.44				
		+200		1.50	1.78	100.00	178.00				
		+300		1.55	1.53	100.00	152.50				
		+400		1.56	1.56	100.00	155.50				
		+500		1.73	1.65	100.00	164.50				
		+604		1.97	1.85	104.00	192.40				
		+605				Pa,bk,ls					
729	397km	+609	8	Ras,pel							
		+613				Pa,bk,ls					
		+614		1.98							
		+700		1.69	1.84	86.00	157.81				
		+800		1.51	1.60	100.00	160.00				

1.4. Transverse Drainage, U-Shape Gutter and Catchment drain

1) The first stage

(1) U-Shape Gutter, Catchment drain

Assumption ; (a) U-Shape Gutter is newly established on the side in the new establishment fill and the cut land.
 (b) The Catchment drain is made from the interval of 50m.

Station Name	Earth Fill Section		Cutting Section	
	Side ditch Length L(m)	Catchment drain no	Side ditch Length L(m)	Catchment drain no
Changage	-	-	-	-
Lahat 434km+169	-	-	70	1
Sukacinta 423km+632	100	2	163	3
Banjarsari 406km+831	100	2	75	2
Muaraenim 369km+093	58	1	-	-
φ	-	-	-	-
Double Tracking	-	-	-	-
φ	-	-	-	-
PbrX6 325km+509	-	-	-	-
Prabumulih 322km+295	-	-	-	-
Lembak 338km+188	-	-	-	-
Karangendah 345km+594	-	-	-	-
Glumbang 353km+822	-	-	-	-
Serdang 363km+479	-	-	-	-
Payakabung 373km+335	-	-	-	-
Simpang 388km+500	-	-	-	-
Kertapati 400km+102	-	-	-	-
Lt~Me X6~Ktp	258	5	308	6
Total	258	5	308	6

2) The second stage

(1) U-Shape Gutter, Catchment drain

- Assumption ;
 (a) U-Shape Gutter is newly established on the side in the new establishment fill and the cut land.
 (b) The Catchment drain is made from the interval of 50m.

Station Name	Earth Fill Section		Cutting Section	
	Side ditch Length L(m)	Catchment drain no	Side ditch Length L(m)	Catchment drain no
Change				
Lahat 434km+169	288	6	70	1
Sukacinta 423km+632	300	6	263	5
Banjarsari 406km+831	200	4	275	6
Muaraenim 369km+093	158	3	200	4
§	-	-	-	-
Double Tracking	-	-	-	-
§	-	-	-	-
PbrX6 325km+509	-	-	-	-
Prabumulih 322km+295	192	4	-	-
Lembak 338km+188	-	-	-	-
Karangendah 345km+594	239	5	-	-
Glumbang 353km+822	-	-	-	-
Serdang 363km+479	-	-	-	-
Payakabung 373km+335	-	-	218	4
Simpang 388km+500	-	-	-	-
Kertapati 400km+102	-	-	-	-
Lt~Me X6~Ktp	1,377	28	1,026	20
Total	1,377	28	1,026	20

New establishment Signal Cabin

Station Name	Earth Fill Section		Cutting Section	
	Side ditch Length L(m)	Catchment drain no	Side ditch Length L(m)	Catchment drain no
Change	-	-	-	-
Lahat 434km+169	-	-	-	-
Muaraenim 369km+093	-	-	-	-
⊕	-	-	-	-
Double Tracking	-	-	-	-
⊕	-	-	-	-
PbrX6 325km+509	-	-	-	-
Prabumulih	-	-	-	-
322km+295	-	-	-	-
Signal Cabin Near 330km	400	8	300	6
Lembak 338km+188	-	-	-	-
Karangendah	-	-	-	-
345km+594	-	-	-	-
Glumbang	-	-	-	-
353km+822	-	-	-	-
Serdang 363km+479	-	-	-	-
Payakabung 373km+335	-	-	-	-
Signal Cabin Near 380km	700	14	-	-
Simpang	-	-	-	-
388km+500	-	-	-	-
Kertapati 400km+102	-	-	-	-
Lt~Me X6~Ktp Total	1,100	22	300	6
	1,100	22	300	6

3)The third stage

Station Name	Earth Fill Section		Cutting Section	
	Side ditch Length L(m)	Catchment drain no	Side ditch Length L(m)	Catchment drain no
Change				
Lahat 434km+169	288	6	370	7
Sukacinta 423km+632	500	10	363	7
Banjarsari 406km+831	200	4	575	12
Muaraenim 369km+093	158	3	500	10
φ	-	-	-	-
Double Tracking	-	-	-	-
φ	-	-	-	-
PbrX6 325km+509	-	-	-	-
Prabumulih	392	8	100	-
322km+295				
Lembak	100	-	239	-
338km+188				
Karangendah	439	9	100	-
345km+594				
Glumbang	-	-	300	-
353km+822				
Serdang	100	-	200	-
363km+479				
Payakabung	189	4	318	6
373km+335				
Simpang	300	-	-	-
388km+500				
Kertapati	-	-	-	-
400km+102				
Lt~Me				
X6~Ktp	2,666	44	3,065	42
Total				
The second stage Total	1,100	28	300	20
The third stage The increase amount	1,566	16	2,765	22

New establishment Signal Cabin

Station Name Change	Earth Fill Section		Cutting Section	
	Side ditch Length L(m)	Catchment drain no	Side ditch Length L(m)	Catchment drain no
Lahat 434km+169	-	-	-	-
Muaraenim 369km+093	-	-	-	-
φ	-	-	-	-
Double Tracking φ	-	-	-	-
PbrX6 325km+509	-	-	-	-
Prabumulih 322km+295	-	-	-	-
Signal Cabin Near 330km	700	14	300	6
Lembak 338km+188	-	-	-	-
Karangendah 345km+594	-	-	-	-
Glumbang 353km+822	-	-	-	-
Serdang 363km+479	-	-	-	-
Payakabung 373km+335	-	-	-	-
Signal Cabin Near 380km	1,000	20	-	-
Simpang 388km+500	-	-	-	-
Kertapati 400km+102	-	-	-	-
Lt~Me X6~Ktp	1,700	34	300	6
Total	1,700	34	300	6
The second stage Total	1,100	22	300	6
The third stage The increase amount	600	12	0	0

4)The third stage(whole line double-track line making project plan)

(1) U-Shape Gutter, Catchment drain

Assumption :

- (a) U-Shape Gutter is newly established on the side in the new establishment fill and the cut land.
- (b) The Catchment drain is made from the interval of 50m.
- (c) It doesn't contain the Cilapati station.

Station Name	Earth Fill Section			Cutting Section		
	Side ditch Length L(m)	Catchment drain no	Catchment drain no	Side ditch Length L(m)	Catchment drain no	Catchment drain no
Chanage	-	-	-	-	-	-
Lahat 434km+169	6,000	120	-	5,100	102	-
Sukacinta 423km+632	8,510	170	404	8,100	162	379
Banjarsari 406km+831	5,686	114	-	5,750	115	-
Muararenin 369km+093	-	-	-	-	-	-
⊕	-	-	-	-	-	-
Double Tracking	-	-	-	-	-	-
⊕	-	-	-	-	-	-
PbrX6 325km+509	1,550	31	-	1,150	23	-
Prabumulih 322km+295	7,600	152	-	8,600	172	-
Lembak 338km+188	2,800	56	405	4,700	94	679
Karangendah 345km+594	2,700	54	-	5,600	112	-
Glumbang 353km+822	2,583	52	-	7,000	140	-
Serdang 363km+479	3,000	60	-	6,900	138	-
Payakabung 373km+335	11,403	228	-	3,600	72	-
Simpang 388km+500	10,566	211	439	-	-	72
Kertapati 400km+102	-	-	-	-	-	-
Lf~Me X6~Ktp	62,398	1,248	1,248	56,500	1,130	1,130
Total	62,398	1,248	1,248	56,500	1,130	1,130

(2) 横断排水路

DLJ.No.52			LINTAS : PRABUMULIH - LAHAT									
No Urut	B H No	Letak Km	Bentang (m)			MACAM		Kali/Curah	Berat Jemb baja kg	Vol.Jemb Bet.m3	Volume Pa/Pi m3	
			hulu	hilir	Emp	B A	B B					
444												
		PRABUMULIH KM. 322 + 295										
1	730	323+510	0.8				Pipa besi					
2	731	323+841	1				Duiker					
3	732	324+438	0.7				Cemen koker					
4	733	324+893	1.5				Duiker					
5	733a	325+227	0.3				Pipa besi					
			0.3				Pipa besi					
6	734	325+326	0.7				Cemen koker					
		Drainage works					Boxculvert	0				
							Duiker	2				
							Saluran terbuka, Opendoorla	0				
							Pipa besi	2				
							Bis beton, Beton buis	0				
							Koker	2				
							Armuco	0				
							Pelat beton	0				
							Gorong-gorong	0				
							Pasangan batu	0				
						Pbm~X6 Σ	6					
							Pbr x6 Km. 325 + 509					
							Double Tracking Work Section					
							↓					
							Penimur Km. 333 + 428					
							N I R U Km. 344 + 254					
							Blimbing Km. 354 + 344					
							Gunung Megang Km. 367 + 039					
							Pamanggilan Km. 374 + 446					
							Ujanmas Km. 381 + 529					
							↑					
							Double Tracking Work Section					
							MJARAENIM KM. 396 + 091					
1	915	396+427					Pa.bet.sm					
			25				Dd.rk.llb	Aer Enim	49824	-		
							Pi.bet.sm					
			50				Dd.rk.ttp		127417	-		
							Pi.bet.sm			2470		
			25				Dd.rk.llb		49824	-		
							Pa.bet.sm					
2	916	396+763	0.5				Cemen koker					
3	917	397+229	0.5				Cemen koker					
4	918	397+447	0.5				Cemen koker					
5	919	397+608	0.97				Koker					
6	920	397+753	1.5				Duiker					
7	921	398+043	1.5				Pelat beton					
8	922	398+557	1.5				Duiker					
9	923	398+665	1*1				Pelat beton					
10	924	399+082	1*1				Pelat beton					
11	926	399+525	1.5				Duiker					
12	927	399+680	1				Duiker					

DLJ.No.52			LINTAS : PRABUMULIH - LAHAT								
No Urut	B H No	Letak Km	Bentang (m)			MACAM		Kali/Curah	Berat Jemb baja kg	Vol.Jemb Bet.m3	Volume Pa/Pi m3
			hulu	hilir	Emp	B A	B B				
13	928	399+808	0.9				Koker				
14	929	400+050	0.9				Koker				
15	930	400+166	0.9				Koker				
16	931	400+390	0.9				Koker				
17	932	400+502	0.9				Koker				
18	933	400+711	0.9				Koker				
19	934	401+016	0.9				Koker				
20	935	401+161					Pa,bet.sm				
			30				Dd,rk,ttp	Aer Lawai	57996	-	540
							Pa,bet.sm				
21	936	401+275	0.7				Koker				
22	937	401+380	0.7				Koker				
23	938	401+515	0.7				Koker				
24	939	401+725	0.9				Koker				
25	940	401+860	0.9				Koker				
26	941	402+112	0.9				Koker				
27	942	402+481	2.5				Koker				
28	943	403+058	2.5				Koker				
29	944	403+478	0.7				Koker				
30	945	43+631	0.7				Koker				
31	946	403+751	0.7				Koker				
32	947	404+213	0.7				Koker				
33	948	404+337	2.5				Koker				
34	949	404+702	0.7				Koker				
35	950	404+882	0.9				Koker				
36	951	405+602	3				Koker				
37	952	405+870	0.7				Koker				
38	953	406+316					Pa,bk,ls				
			10				Bet,Com	Aer Tiawar	-	31.3	340
							Pa,bk,ls				
39	954	406+434	0.9				Koker	①			
							Boxculvert	0			
							Duiker	4			
							Saluran terbuka,Opendoorla	0			
							Pipa besi	0			
							Bis beton,Beton buis	0			
							Koker	29			
							Armucoc	0			
							Pelat beton	3			
							Gorong-gorong	0			
							Pasangan batu	0			
							Me~Bji Σ	36			
							Banjarsari Km. 406 + 831				
40	955	407+025	3				Pelat beton	②			
41	955a	407+176	0.3				Duiker	②			
42	956	407+440	0.7				Koker				
43	957	407+566	0.7				Koker				
44	958	407+628					Pa,bk,ls				
			6				Bet,bert		-	13	106
							Pa,bk,ls				
45	960	407+806	2				Duiker				
46	961	408+091	2				Duiker				
47	962	408+561	0.9				Koker				
48	962a	408+6/7	0.9				Gorong-gorong				
49	963	408+951	0.9				Koker				
50	964	409+387	3				Duiker				
51	965	409+504	0.7				Koker				
52	966	409+748	1.5				Duiker				
53	967	409+880	1				Pelat beton				
54	968	410+405	2.5				Duiker				
55	969	410+618	0.7				Koker				
56	970	410+780	0.9				Koker/pipa				
57	971	410+988	1				Pelat beton				
58	973	411+298	0.7				Pelat beton				

DLJ.No.52			LINTAS : PRABUMULIH - LAHAT								
No Urut	B H No	Letak Km	Bentang (m)			MACAM		Kali/Curah	Berat Jemb baja kg	Vol.Jemb Bet.m3	Volume Pa/Pi m3
			hulu	hilir	Emp	B A	B B				
59	974	411+506	0.9				Koker/pipa				
60	975	411+934	3				Duiker				
61	976	412+370	0.7				Koker				
62	977	412+480	4.4				ARMCO	Aer Tabu	-	-	-
			4.4				ARMCO				
63	977	412+480	0.45				Armco				
64	978	413+423	2.5				Duiker				
65	979	413+981	1				Box Culvert				
66	980	414+312	0.7				Koker				
67	981	414+553	3				Duiker	①St			
68	982	414+920	2.5				Duiker	①St			
69	983	415+178	1				Pelat beton	②St			
70	984	416+261	1				Pelat beton				
71	985	416+567	1				Pelat beton				
72	986	416+643	2.5				Duiker				
73	987	416+902					Pa,bet.por				
			20				Ras,rk	Aer Kungkulan	28258	-	131
							Pa,bet.por				
74	988	417+102	1				Pelat beton				
75	989	417+347	0.9				Pasangan batu				
76	990	417+508	0.7				Pasangan batu				
77	991	417+7/8	0.7				Pasangan batu				
78	992	417+8/9	0.7				Pasangan batu				
79	993	418+0/1	0.9				Gorong2 Pasangan batu				
80	994	418+8/9	2				Pelat beton				
81	995	419+0/1	0.9				Pasangan batu				
			0.9				Pasangan batu				
82	996	419+3/4	1				Pelat beton				
83	997	419+423	1				Gorong2 Pasangan batu				
84	998	419+893					Pa,bet,sm				
			60				Dd,rk.ttp	Aer Lematang	193527	-	
							Pi,bet,sm				
			40				Dd,rk.ttp		88258	-	
							Pi,bet,sm				2490
			30				Dd,rk.ttp		57996	-	
							Pi,bet,sm				
			30				Dd,rk.ttp		57996	-	
							Pa,bet,sm				
85	998	419+4/5	2				Pasangan batu				
86	999	420+2/3	0.9				Pasangan batu				
87	1000	420+3/4	2				Pasangan batu				
88	1001	420+3/4	2				Pelat beton				
89	1001a	420+8/9	0.7				Pasangan batu				
90	1001b	420+8/9	0.7				Pasangan batu				
91	1002	421+3/4	0.7				Pasangan batu				
92	1003	421+6/7	1				Pelat beton				
93	1004	421+7/8	1				Pelat beton				
94	1005	421+9/0	2				Pasangan batu				
95	1006	422+2/3	0.9				Pasangan batu				
96	1007	423+3/4	0.9				Pasangan batu	②			
			0.9				Pasangan batu				
							Boxculvert			1	
							Duiker			11	
							Saluran terbuka,Opendoorla			0	
							Pipa besi			0	
							Bis beton,Beton buis			0	
							Koker			10	
							Armuco			2	
							Pelat beton			13	
							Gorong-gorong			1	
							Pasangan batu			16	
							Bji~Sct Σ			54	

DLJ.No.52			LINTAS : PRABUMULIH - LAHAT								
No Urut	B H No	Letak Km	Bentang (m)			MACAM		Kali/Curah	Berat Jemb baja kg	Vol.Jemb Bet.m3	Volume Pa/Pi m3
			hulu	hilir	Emp	B A	B B				
Sukacinta Km. 423 + 632											
97	1008	423+9/0	2				Pasangan batu	①			
98	1009	424+3/4	2				Pasangan batu				
99	1009a	424+4/5	0.3				Gorong-gorong				
100	1009b	424+4/5	0.3				Gorong-gorong				
101	1010	424+682	5.4				ARMCO		-	-	-
			5.4				ARMCO				
102	1010a	424+6/7	5.4				A r m c o				
103	1011	425+7/8	0.3				Gorong-gorong				
104	1012	425+7/8	0.7				Gorong-gorong				
105	1013	426+1/2	0.3				Gorong-gorong				
106	1014	426+1/2	0.7				Gorong-gorong				
107	1015	426+1/2	0.3				Gorong-gorong				
108	1016	426+3/4	1.5				Pelat beton				
109	1017	426+5/6	0.9				Pasangan batu				
110	1018	426+9/0	0.9				Pasangan batu				
			0.9				Pasangan batu				
Padang Bungatanjung Km. 427 + 000											
111	1019	427+6/7	0.9				Pasangan batu				
112	1020	428+1/2	3				Pasangan batu				
113	1021	428+3/4	0.9				Pasangan batu				
114	1022	429+0/1	0.7				Gorong-gorong				
115	1023	429+4/5	0.9				Pasangan batu				
116	1024	429+7/8	0.7				Pasangan batu				
117	1025	430+317	6.3				ARMCO		-	-	-
			6.3				ARMCO				
118	1025a	430+3/4	6.3				ARMCO				
			6.3				ARMCO				
119	1026	430+3/4	0.7				Pasangan batu				
120	1027	430+9/0	0.9				Pasangan batu				
			0.9				Pasangan batu				
121	1028	431+2/3	0.7				Pasangan batu				
122	1029	431+6/7	0.7				Pasangan batu				
123	1030	432+0/1	0.9				Pasangan batu				
			0.9				Pasangan batu				
124	1030a	432+2/3	0.9				Gorong-gorong				
125	1030b	432+2/3	0.7				Gorong-gorong				
126	1031	432+6/7	0.7				Gorong-gorong				
127	1032	432+9/0	0.9				Pasangan batu				
			0.9				Pasangan batu				
128	1032a	433+2/3	0.3				Gorong-gorong	①			
129	1032b	433+2/3	0.3				Gorong-gorong	①			
130	1033	433+4/5	0.9				Pasangan batu	①			
131	1034	433+9/0	0.7				Pasangan batu	①			
							Boxculvert	0			
							Duiker	0			
							Saluran terbuka, Opendoorla	0			
							Pipa besi	0			
							Bis beton, Beton buis	0			
							Koker	0			
							Armucoc	4			
							Pelat beton	1			
							Gorong-gorong	13			
							Pasangan batu	17			
							Sct~Lt Σ	35			
L A H A T KM. 434 + 159											

DLJ.No.51			LINTAS : PRABUMULIH - KERTAPATI								
No Urut	B H No	Letak Km	Bentang (m)			MACAM		Kali/Curah	Berat Jemb baja kg	Vol.Jemb bet m3	Volume Pa/Pi m3
			hulu	hilir	Emp	B A	B B				
PRABUMULIH KM. 322 + 295											
1	639	322+5/6	2				Box culvert	①	-	-	136
2	640	322+568	1				Duiker	①			
3	641	322+960	0.7				Saluran terbuka				
			0.7				Saluran terbuka				
4	642	323+002	1				Duiker				
5	643a	323+6/7	0.6				Pipa besi				
			0.6				Pipa besi				
6	644	324+307	1				Duiker				
7	645	324+381	0.5				Buis beton				
8	646	325+367	2				Duiker				
9	647	325+707	0.5				Buis beton				
10	648	326+911	0.5				Buis beton				
11	649	326+531	2				Duiker				
			2				Duiker				
12	650	329+081	0.5				Buis beton				
13	651	329+804	0.5				Buis beton				
14	652	331+803	2				Duiker				
15	653	332+948	0.5				Buis beton				
16	654	334+159	0.5				Buis beton				
17	655	335+158	0.5				Buis beton				
18	656	336+310	0.5				Buis beton				
19	657	336+795	2				Duiker				
20	658	336+456	0.5				Buis beton				
21	659	337+891	3				Duiker	②			
							Boxculvert				1
							Duiker				8
							Saluran terbuka, Opendoorla				1
							Pipa besi				1
							Bis beton, Beton buis				10
							Koker				0
							Armuco				0
							Pelat beton				0
							Gorong-gorong				0
							Pasangan batu				0
							Pbm~Leb Σ				21
L e m b a k Km. 338 + 090											
22	660	338+680	18*3				Double Duiker				
23	661	338+826	0.44				Beton cor				
24	662	339+409	1.5				Duiker				
25	663	339+500	0.7				Cemen koker				
26	664	340+565	0.5				Buis beton				
27	665	341+688	0.7				Cemen koker				
28	666	342+588	2				Duiker				
29	667	343+910	0.5				Buis beton				
30	668	344+431	2				Duiker				
			2				Duiker				
31	669	345+213	0.7				Duiker	②			
							Boxculvert				0
							Duiker				5
							Saluran terbuka, Opendoorla				0
							Pipa besi				0
							Bis beton, Beton buis				3
							Koker				2
							Armuco				0
							Pelat beton				0
							Gorong-gorong				0
							Pasangan batu				0
							Leb~Keb Σ				10

DLJ.No.51			LINTAS : PRABUMULIH - KERTAPATI									
No Urut	B H No	Letak Km	Bentang (m)			MACAM		Kali/Curah	Berat Jemb baja kg	Vol.Jemb bet m3	Volume Pa/Pi m3	
			hulu	hilir	Emp	B A	B B					
Karangendah Km. 345 + 549												
32	670	345+863	2				Duiker	①				
33	671	345+227	1				Duiker	①				
34	672	346+323	2				Duiker					
35	673	348+572	3				Duiker					
36	674	349+485	3				Duiker					
37	675	350+208	1.5				Box Culvert					
38	676	351+321	0.7				Saluran terbuka					
			0.7				Saluran terbuka					
			0.7				Saluran terbuka					
39	678	351+538	1.5				Duiker					
40	679	352+130	1.5				Duiker					
41	680	353+100	1.5				Duiker					
42	681	353+721	0.7				Cemen koker					
							Boxculvert		1			
							Duiker		8			
							Saluran terbuka,Opendoorlat		1			
							Pipa besi		0			
							Bis beton,Beton buis		0			
							Koker		1			
							Armuco		0			
							Pelat beton		0			
							Gorong-gorong		0			
							Pasangan batu		0			
							Keb~Glb Σ		11			
Gelumbang Km. 353 + 833												
43	682	354+680	1				Duiker					
44	683	355+432	2				Duiker					
45	684	356+156	1.5				Duiker					
46	685	358+108	2				Duiker					
47	686	358+875					Pa,bk,ls					
			15			Ras,dl		Rawatalang	18722	-	288	
							Pa,bk,ls					
48	687	358+501	1				Duiker					
49	688	358+221	1				Box Culvert					
50	689	361+472	0.7				Open doorlat					
51	690	362+514	1				Duiker					
52	691	363+303	0.7				Duiker					
							Boxculvert		1			
							Duiker		7			
							Saluran terbuka,Opendoorlat		1			
							Pipa besi		0			
							Bis beton,Beton buis		0			
							Koker		0			
							Armuco		0			
							Pelat beton		0			
							Gorong-gorong		0			
							Pasangan batu		0			
							Glb~Sdn Σ		9			
Serdang Km. 363 + 479												
53	692	363+991	0.5				Duiker	②				
			0.5				Duiker					
54	693	364+787	1.5				Duiker					
55	694	365+247	0.7				Cemen koker					
56	695	367+120	1				Box Culvert					
57	696	367+658	0.7				Cemen koker					
58	697	368+568	2.5				Duiker					
59	698	369+440	0.7				Cemen koker					
60	699	370+516	0.7				Cemen koker					
61	700	371+284	0.7				Cemen koker					
62	701	371+735	0.7				Cemen koker					
63	702	372+184	0.7				Cemen koker					
64	703	373+062	0.7				Cemen koker	②				

DLJ.No.51			LINTAS : PRABUMULIH - KERTAPATI									
No Urut	B H No	Letak Km	Bentang (m)			MACAM		Kali/Curah	Berat Jemb baja kg	Vol.Jemb bet m3	Volume Pa/Pi m3	
			hulu	hilir	Emp	B A	B B					
		Drainage works					Boxculvert	1				
								Duiker	3			
								Saluran terbuka,Opendoorlat	0			
								Pipa besi	0			
								Bis beton,Beton buis	0			
								Koker	8			
								Armuco	0			
								Pelat beton	0			
								Gorong-gorong	0			
								Pasangan batu	0			
							Sdn~Pyk Σ	12				
							Payakabung Km. 373 + 335					
65	704	373+999	1				Cemen koker					
66	705	374+081	0.7				Open doorlat					
			0.7				Open doorlat					
67	706	374+663	0.9				Cemen koker					
68	707	375+140	0.7				Cemen koker					
69	708	376+151	2.25				D u i k e r					
70	709	376+840	0.7				Open doorlat					
71	710	377+558	0.7				Cemen koker					
72	711	378+971	0.7				Beton buis					
73	711a	379+989	1				Beton buis	①St				
74	712	380+491	1				A r m c o	②St				
75	713	381+310	1.5				Box Culvert					
76	714	382+325					Pa,bk,ls					
			8				Ras,dl	Plani	7039	-	260	
							Pa,bk,ls					
77	715	383+121					Pa,bk,ls					
			12.5				Ras,dl	Talangburuh	16282	-	275	
							Pa,bk,ls					
78	716	383+835					Pa,bk,ls					
			15				Dind,pel	Rambutan	33927	-	269	
							Pa,bk,ls					
79	717	385+753					Pa,bk,ls					
			12				Dind,pel	Rawa bakung	24488	-	228	
							Pa,bk,ls					
80	718	387+038					Pa,bk,ls					
			40				Dd,rk,ttp	Simpang	135650	-	408	
							Pa,bk,ls					
81	719	387+732	1.5				Box Culvert					
		Drainage works					Boxculvert	2				
								Duiker	1			
								Saluran terbuka,Opendoorlat	2			
								Pipa besi	0			
								Bis beton,Beton buis	2			
								Koker	4			
								Armuco	1			
								Pelat beton	0			
								Gorong-gorong	0			
								Pasangan batu	0			
							Pyk~Sig Σ	12				
							S i m p a n g Km. 388 + 500					
82	720	389+872					Pa,bk,ls					
			8				Ras,dl	Rawa-rawa	9900	-	163	
							Pa,bk,ls					
83	721	390+786					Pa,bk,ls					
			12				Dind,pel	R,Waringin	24488	-	212	
							Pa,bk,ls					
84	722	392+765					Pa,bk,ls					
			20				Dind,pel	Badak	47440	-	504	
							Pa,bk,ls					

DLJ.No.51			LINTAS : PRABUMULIH – KERTAPATI											
No Urut	B H No	Letak Km	Bentang (m)			MACAM		Kali/Curah	Berat Jemb baja kg	Vol.Jemb bet m3	Volume Pa/Pi m3			
			hulu	hilir	Emp	B A	B B							
85	723	393+609				Ras.dl	Pa,bk,ls	Rasauw	13318	-	280			
			12				Pa,bk,ls							
86	724	394+259				Ras.dl	Pa,bk,ls	Plaju	7039	-	292			
			8				Pa,bk,ls							
87	725	394+757				Ras.dl	Pa,bk,ls	Karangtengah	18722	-	330			
			15				Pa,bk,ls							
88	726	395+574				Dind,pe	Pa,bk,ls	Waru	25166	-	332			
			15				Pa,bk,ls							
89	727	396+192				Ras.dl	Pa,bk,ls	Parah	9900	-	259			
			8				Pa,bk,ls							
90	728	397+047				Ras.dl	Pa,bk,ls	Sejawi	7039	-	322			
			8				Pa,bk,ls							
91	729	397+609				Ras,pe	Pa,bk,ls	Lengi	5975	-	308			
			8				Pa,bk,ls							
92	732	398+328	0.8				Open doorlat							
			0.8				Open doorlat							
93	732b	399+196	0.8				Open doorlat							
			0.8				Open doorlat							
Drainage works			Boxculvert			0								
			Duiker			0								
			Saluran terbuka,Open doorlat			2								
			Pipa besi			0								
			Bis beton,Beton buis			0								
			Koker			0								
			Armuco			0								
			Pelat beton			0								
			Gorong-gorong			0								
			Pasangan batu			0								
			Sig~Kpt Σ			2								
KERTAPATI KM. 399 + 915														
Prabumulih~Kertapati Total														
						Double-track		Transition	Final					
Drainage works			Boxculvert			6	45	1						
			Duiker			32			3	3				
			Saluran terbuka,Open doorlat			7								
			Pelat beton			0			32					
			Pipa besi			1								
			Bis beton,Beton buis			15				-1				
			Koker			15					1			
			Armuco			1					-1			
			Gorong-gorong			0								
			Pasangan batu			0								
			Pbm~Kpt Σ			77			4(1)	4(1)				
								※ () new St						

1.5. Bridge Superstructure and Substructure Quantity

- Calculation Condition;
- 1 Calculate by using Bridge List so as not to have Completion Document
 - 2 Exclude between Maraenim and Pbrx6 that Double Tracking Work has been Executed
 - 3 Quantity of New Bridge shall be calculated referring to Bridge List and Table, because Existing Bridge has been reinforced considering design load 18t.

1) Superstructure; from Bridge List

	Unit	Lt~Pbm	Pbm~Pyk	Pyk~Kpt	Lt~Kpt
Truss	kg	711,096	-	135,650	846,746
Plate Girder	kg	-	18,722	250,723	269,445
RC Girder	m ³	13	-	-	13
H Steel Embedding Girder	m ³	31	-	-	31

2) Substructure

(1) Concrete Volume; from Bridge List

	Unit	Lt~Pbm	Pbm~Pyk	Pyk~Kpt	Lt~Kpt
Pier	m ³	6,077	288	4,442	10,807
Abutment					

(2) Foundation Excavation Volume

	Lt~Pbm		Pbm~Pyk		Pyk~Kpt		Lt~Kpt
	Place	Excavation Vm ³	Place	Excavation Vm ³	Place	Excavation Vm ³	Excavation Vm ³
Pier	5	1,550	0	-	0	-	1,550
Abutment	12	2,232	2	372	30	5,580	8,184
Σ	-	3,782	-	372	-	5,580	9,734

※Assume as following dimension

Pier; Plan Shape B×L (m).m = 9.000 × 9.000
 Height H (m).m = 1.800
 Earth Covering h (m).m = 1.000
 Added excavation Width b (m).m = 0.500
 Flat Concrete and Cobble c (m).m = 0.300

$$\begin{aligned}
 \text{Excavation Volume V} &= (B+b \times 2) \times (L+b \times 2) \times (H+h+0.30) \\
 &= (9.00 + 0.50 \times 2) \times (9.00 + 0.50 \times 2) \\
 &\quad \times (1.80 + 1.00 + 0.30) \\
 &= 310 \text{ m}^3/\text{place}
 \end{aligned}$$

Abutment Plan Shape B×L (m).m = 6.000 × 6.000
 Height H (m).m = 1.500
 Earth Covering h (m).m = 2.000
 Added excavation Width b (m).m = 0.500
 Flat Concrete and Cobble c (m).m = 0.300

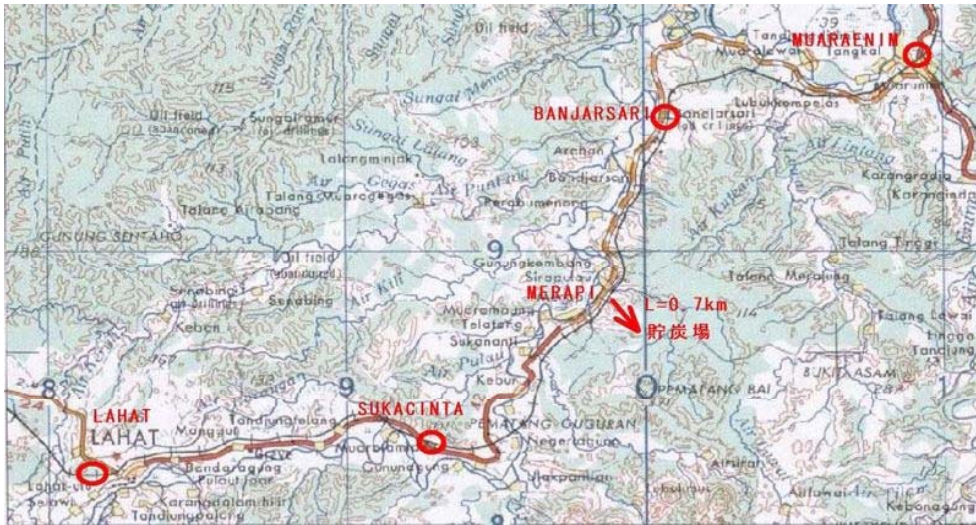
$$\begin{aligned}
 \text{Excavation Volume V} &= (B+b \times 2) \times (L+b \times 2) \times (H+h+0.30) \\
 &= (6.00 + 0.50 \times 2) \times (6.00 + 0.50 \times 2) \\
 &\quad \times (1.50 + 2.00 + 0.30) \\
 &= 186 \text{ m}^3/\text{place}
 \end{aligned}$$

DLJ.No.52			LINTAS : PRABUMULIH – LAHAT									
No Urut	B H No	Letak Km	Bentang (m)			MACAM		No. Seri	Kali/Curah	Berat Jemb baja kg	Vol.Jemb Bet.m3	Volume Pa/Pi m3
			hulu	hilir	Emp	B A	B B					
44	958	407+628					Pa,bk,ls					
			6			Bet,bert	Byb,no.812		-	13	106	
73	987	416+902					Pa,bk,ls Pa,bet,por					
			20			Ras,rk	B.no.871/B.82	Aer Kungkulan	28,258	-	131	
84	998	419+893					Pa,bet,por Pa,bet,sm					
			60			Dd,rk,ttp	B.no.882/B.79a	Aer Lematang	193,527	-		
			40			Dd,rk,ttp	B.no.878/B.92		88,258	-		
			30			Dd,rk,ttp	B.no.874/B.78b		57,996	-		2,490
			30			Dd,rk,ttp	B.no.874/B.78b		57,996	-		
							Pa,bet,sm					
						Ras,dl	0					
						Dind,peI	0					
						Dd,rk,ttp	4		397,777			
						Ras,peI	0					
						Dd,rk,Ilb	0					
						Ras,rk	1		28,258			
						Bet,bert	1			13		
						Bet,Com	0					
									W(kg)	V(m3)	V(m3)	
						Bji~Sct	Σ	6	426,035	13	2,727	
						<i>Sukacinta Km. 423 + 632</i>						
						Ras,dl	0					
						Dind,peI	0					
						Dd,rk,ttp	0					
						Ras,peI	0					
						Dd,rk,Ilb	0					
						Ras,rk	0					
						Bet,bert	0					
						Bet,Com	0					
									W(kg)	V(m3)	V(m3)	
						Sct~Lt	Σ	0	-	-	-	
						<i>L A H A T KM. 434 + 159</i>						
						Lahat~Muaraenim, PbrX6~Prabumulih Total						
						Ras,dl	0	(I shape girder)	-	-		
						Dind,peI	0	(Through plate girder)	-	-		
						Dd,rk,ttp	6	(Through truss girder)	583,190	-		
						Ras,peI	0	(Plate girder)	-	-		
						Dd,rk,Ilb	2	(Pony truss)	99,648	-		
						Ras,rk	1	(Truss)	28,258	-		
						Bet,bert	1	(RC girder)	-	13		
						Bet,Com	1	(H steel embedding girder)	-	31		
									W(kg)	V(m3)	V(m3)	
						Pbm~Lt	Σ	11	711,096	44	6,077	
									Abutment	Pa,ber,sm	6	
									Pier	Pi,ber,sm	5	
									Abutment	Pa,bk,ls	4	
									Abutment	Pa,ber,por	2	

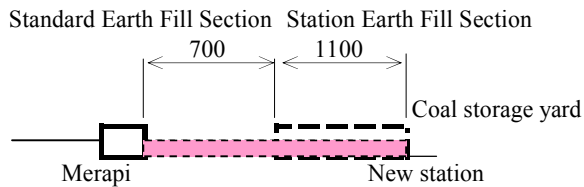
DLJ.No.51			LINTAS : PRABUMULIH – KERTAPATI									
No Urut	B H No	Letak Km	Bentang (m)			MACAM		No. Seri	Kali/Curah	Berat Jemb baja kg	Vol.Jemb bet m3	Volume Pa/Pi m3
			hulu	hilir	Emp	B A	B B					
KORIDOR PRABUMULIH – KERTAPATI												
PRABUMULIH Km. 322 + 295												
L e m b a k Km. 338 + 090												
Karangendah Km. 345 + 549												
Gelumbang Km. 353 + 833												
47	686	358+875					Pa.bk.ls					
			15				Ras.dl	B.no.410 Aus	Rawatalang	18,722	-	288
							Pa.bk.ls					
Bridge			Ras.dl				1	(I shape girder)		18,722		
			Dind.pel				0	(Through plate girder)				
			Dd.rk.ttp				0	(Through truss girder)				
			Ras.pel				0	(Plate girder)				
			Dd.rk.llb				0	(Pony truss)				
			Ras.rk				0	(Truss)				
			Bet.bert				0	(RC girder)				
			Bet.Com				0	(H steel embedding girder)				
			Glb~Sdn Σ				1			W(kg)	V(m3)	V(m3)
										18,722	-	288
Serdang Km. 363 + 479												
Payakabung Km. 373 + 335												
76	714	382+325					Pa.bk.ls					
			8				Ras.dl	B.no.386/Ab.8-8	Plani	7,039	-	260
							Pa.bk.ls					
77	715	383+121					Pa.bk.ls					
			12.5				Ras.dl	B.no.443c/Aus	Talangburuh	16,282	-	275
							Pa.bk.ls					
78	716	383+835					Pa.bk.ls					
			15				Dind.pel	B.no.438 Aus	Rambutan	33,927	-	269
							Pa.bk.ls					
79	717	385+753					Pa.bk.ls					
			12				Dind.pel	B.no.415 Aus	Rawa bakung	24,488	-	228
							Pa.bk.ls					
80	718	387+038					Pa.bk.ls					
			40				Dd.rk.ttp	B.no.428 Aus	Simpang	135,650	-	408
							Pa.bk.ls					
Bridge			Ras.dl				2			23,321		
			Dind.pel				2			58,415		
			Dd.rk.ttp				1			135,650		
			Ras.pel				0					
			Dd.rk.llb				0					
			Ras.rk				0					
			Bet.bert				0					
			Bet.Com				0					
			Pyk~Sig Σ				5			W(kg)	V(m3)	V(m3)
										217,386	-	1,440
Simpang Km. 388 + 500												
82	720	389+872					Pa.bk.ls					
			8				Ras.dl	B.no.386/B.8-8	Rawa-rawa	9,900	-	163

1.6. Short Term Extension ; Consider Extension Line to Coal Strage Yard from Merapi

The second stage ; Construct Coal Handling Plant at Point of 0.7km far from Merapi, New station and New Line is Constructed at Coal Strage Yard



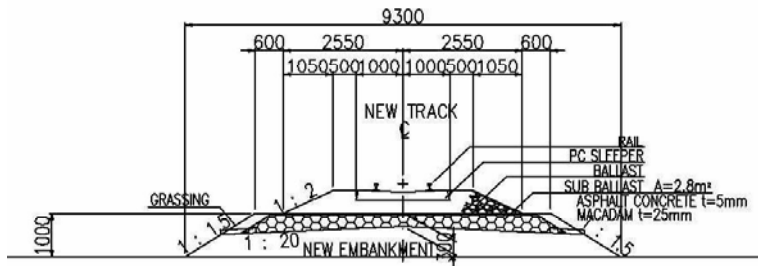
1.6.1. The second stage ; Construct Coal Handling Plant at Point of 0.7km far from Merapi



Assumption ; (1) Station Length is Proposed Train Length (1000m) + allowance (100m)

1) Roadbed and Earth Fill Quantity

[Standard Earth Fill Section]

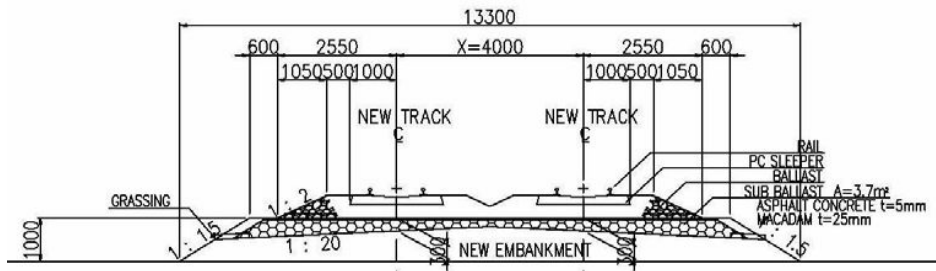


$$\begin{aligned} \text{Roadbed Quantity; Section Area } A_{sb} &= 2.8 \text{ m}^2 \\ \text{Volume } V_{sb} &= A_{sb} \cdot L \\ &= 2.80 \times L \end{aligned}$$

$$\begin{aligned} \text{Earth Fill Quantitu; Volume } V_f &= \{(6.30+9.30)/2 \times 1.00 - A_{sb}\} \times L \\ &= (7.80 - 2.80) \times L \\ &= 5.00 \times L \end{aligned}$$

Here in, A_{sb} ; Roadbed Section Area (m^2)
 V_{sb} ; Roadbed Volume (m^3)
 L ; Total Length (m)
 h ; Earth Fill Height (m) = 1.0 m

[Standard Earth Fill Section in Station]



$$\begin{aligned} \text{Roadbed Quantity; Section Area} \quad \text{Asb} &= 3.7 \quad \text{m}^2 \\ \text{Volume} \quad \text{Vsb} &= \text{Asb} \cdot L \\ &= 3.70 \times L \end{aligned}$$

$$\begin{aligned} \text{Earth Fill Quantitu; Volume} \quad \text{Vf} &= \{(10.30+13.30)/2 \times 1.00 - \text{Asb}\} \times L \\ &= (11.80 - 3.70) \times L \\ &= 8.10 \times L \end{aligned}$$

Here in, Asb ; Roadbed Section Area (m²)
 Vsb ; Roadbed Volume (m³)
 L ; Total Length (m)
 h ; Earth Fill Height (m) = 1.0 m

Roadbed and Earth Fill Quantity Table

Station Name Change	Roadbed and Earth Fill Quantity Table					
	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Earth Fill volume Vf(m ³)	Land Preparation A(m ²)	Slope Work A(m ²)
Merapi Near 415km	-	-	-	-	-	-
↓	1.00	700	1,960	3,500	6,510	2,524
Coal Strage Yard	1.00	1,100	4,070	8,910	14,630	3,966
Merapi~ Coal Strage Yard Total		1,800	6,030	12,410	21,140	6,490

2) U Shape Gutter and Catchment Drain

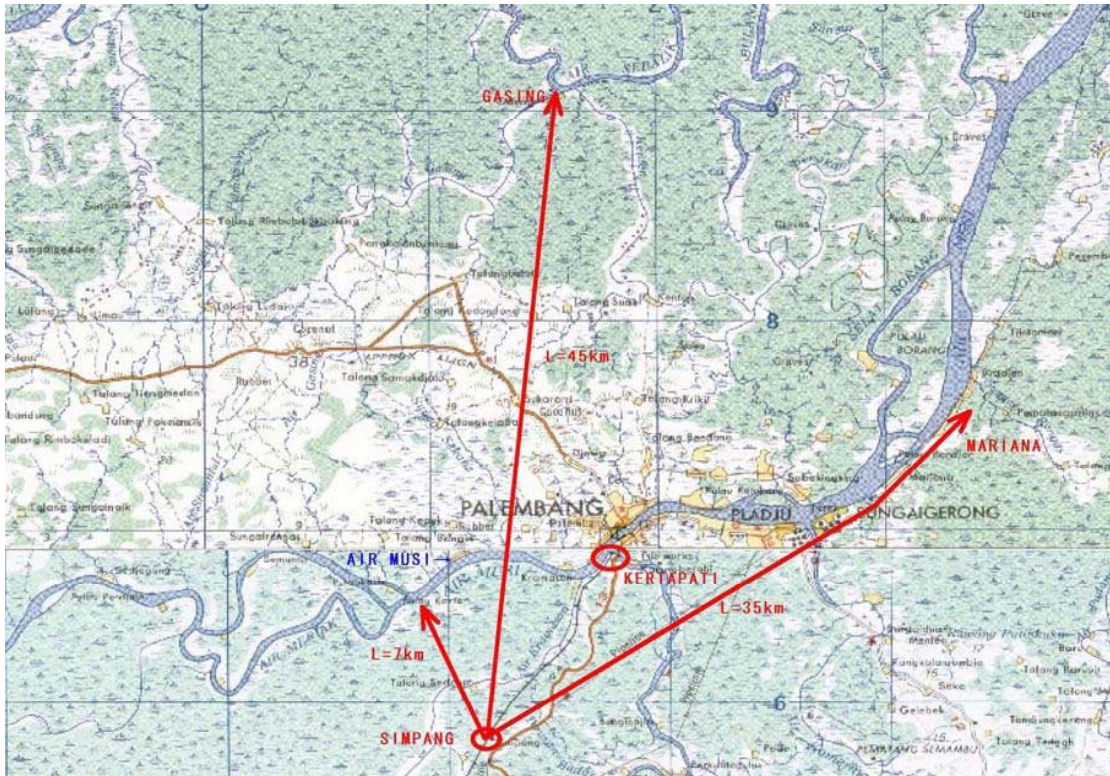
- Assumption ; (a) U-Shape Gutter is newly established on the side in the new establishment fill and the cut land.
 (b) The Catchment drain is made from the interval of 50m.

Station Name Change	Earth Fill Section				
	Width B(m)	Length L(m)	Gutter Length L(m)	Transverce Culvert L(m)	Catchment Drain no
Merapi Near 415km	-	-	-	-	-
↓	12.30	700	1,400	172	28
Coal Strage Yard	16.30	1,100	2,200	359	44
Merapi~ Coal Strage Yard Total		1,800	3,600	531	72

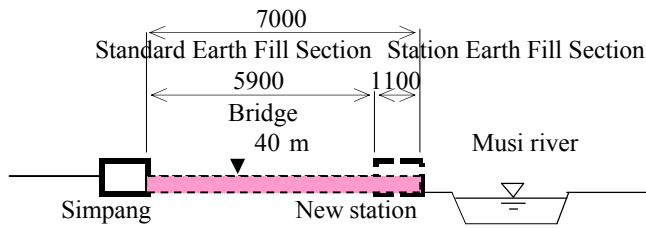
1.7. Extension in Middle and Long Term;

New line from Simpan to the Mushi river, Gashin, and the Mariana district is examined.

- Design 4 ; Construct Coal Handling Plant at Musi River far about 7km from Simpan
It is a new station in the Mushi river. 7km in new line construction
- Design 5 ; Construct Coal Handling Plant at Mariana far about 35km from Simpan
It is a new station in Mariana. 35km in new line construction.
New station installation in 10km.
- Design 6 ; Construct Coal Handling Plant at Gasing far about 45km from Simpan
It is a new station in Gashin. 45km in new line construction.
New station installation in 10km.



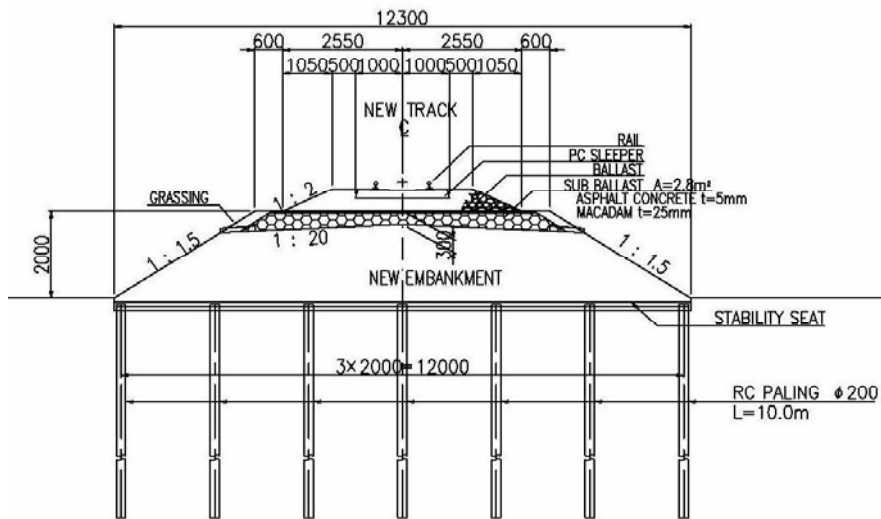
1.7.1. Design 4 - Construct Coal Handling Plant at Musi River far about 7km from Simpang



Assumption ; (1) Station Length is Proposed Train Length (1000m) + allowance (100m)

1) Roadbed and Earth Fill Quantity

[Standard Earth Fill Section]

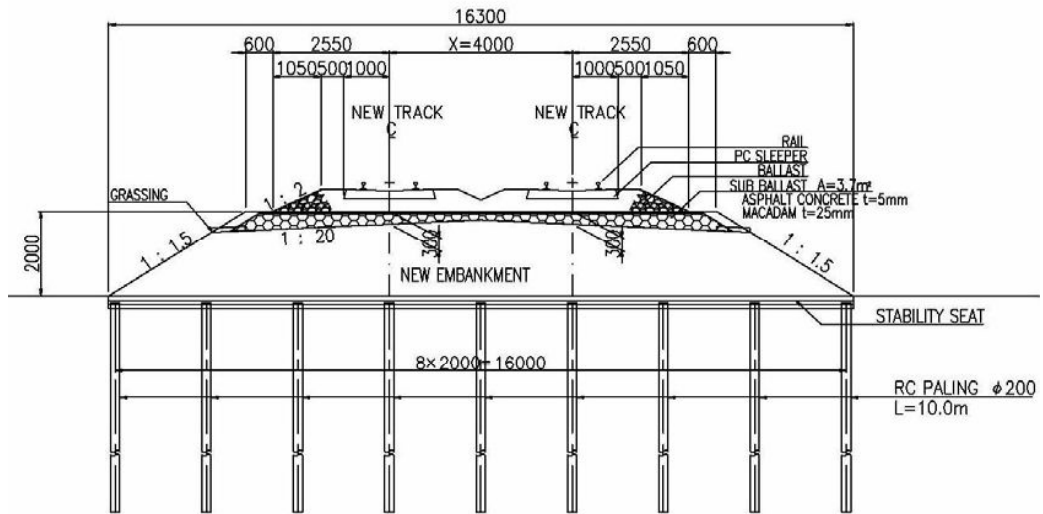


Roadbed Quantity; Section Area $Asb = 2.8 \text{ m}^2$
 Volume $Vsb = Asb \cdot L = 2.80 \times L$

Earth Fill Quantitu; Volume $Vf = \{ (6.30+9.30)/2 \times 2.00 - Asb \} \times L$
 $= (18.60 - 2.80) \times L$
 $= 15.80 \times L$

Here in, Asb ; Roadbed Section Area (m^2)
 Vsb ; Roadbed Volume (m^3)
 L ; Total Length (m)
 h ; Earth Fill Height (m) = 2.0 m

[Standard Earth Fill Section in Station]



$$\begin{aligned} \text{Roadbed Quantity; Section Area } A_{sb} &= 3.7 \text{ m}^2 \\ \text{Volume } V_{sb} &= A_{sb} \cdot L \\ &= 3.70 \times L \end{aligned}$$

$$\begin{aligned} \text{Earth Fill Quantitu; Volume } V_f &= \left\{ \frac{(10.30+9.30)}{2} \times 2.00 - A_{sb} \right\} \times L \\ &= (26.60 - 3.70) \times L \\ &= 22.90 \times L \end{aligned}$$

Here in, A_{sb} ; Roadbed Section Area (m^2)
 V_{sb} ; Roadbed Volume (m^3)
 L ; Total Length (m)
 h ; Earth Fill Height (m) = 2.0 m

Roadbed and Earth Fill Quantity Table

Station Name	Roadbed and Earth Fill Quantity Table					
	Height h(m)	Length L(m)	Roadbed Volume $V_{sb}(\text{m}^3)$	Earth Fill volume $V_f(\text{m}^3)$	Soft subsoil measures $A(\text{m}^2)$	Slope Work $A(\text{m}^2)$
Change Simpang 388km+500	-	-	-	-	-	-
↓	2.00	5,860	16,408	92,588	72,078	42,257
AIR MUSI 395km+500	2.00	1,100	4,070	25,190	17,930	7,932
Sig~ AIR MUSI Total		6,960	20,478	117,778	90,008	50,189

2) Bridge Superstructure and Substructure Quantity

- Assumption
- (1) Because the existing bridge has been reinforced to the design load 18t correspondence, a new establishment bridge angle amount is calculated from the bridge list table.
 - (2) The number of bridges is presumed from 1/250,000 planes.
 - 40m Truss × 1bridge

(i) Superstructure; from Bridge List

	Unit	Bridge	1 bridge weight	Weight	Remarks
Truss	kg	1	90,000	90,000	Refer to BH.No419

(ii) Substructure

(a) Concrete volume; from Bridge List

	Unit	place	One volume	Volume	Remarks
Pier	m ³	0	-	-	-
Abutment		2	204	408	Refer to BH.No718
Σ	-	2	-	408	-

(b) Foundation Excavation Volume

	Simpang~	
	place	Excavation Vm ³
Pier	0	-
Abutment	2	372
Σ	-	372

※Assume as following dimension

Pier;	Plan Shape	B×L (m)	=	9.000	×	9.000
	Height	H (m)	=	1.800		
	Earth Covering	h (m)	=	1.000		
	Added excavation Width	b (m)	=	0.500		
	Flat Concrete and Cobble	c (m)	=	(m) =	0.300	

$$\begin{aligned}
 \text{Excavation Volume V} &= (B+b \times 2) \times (L+b \times 2) \times (H+h+0.30) \\
 &= (9.00 + 0.50 \times 2) \times (9.00 + 0.50 \times 2) \times (1.80 + 1.00 + 0.30) \\
 &= 310 \text{ m}^3/\text{place}
 \end{aligned}$$

Abutment	Plan Shape	B×L (m)	=	6.000	×	6.000
	Height	H (m)	=	1.500		
	Earth Covering	h (m)	=	2.000		
	Added excavation Width	b (m)	=	0.500		
	Flat Concrete and Cobble	c (m)	=	(m) =	0.300	

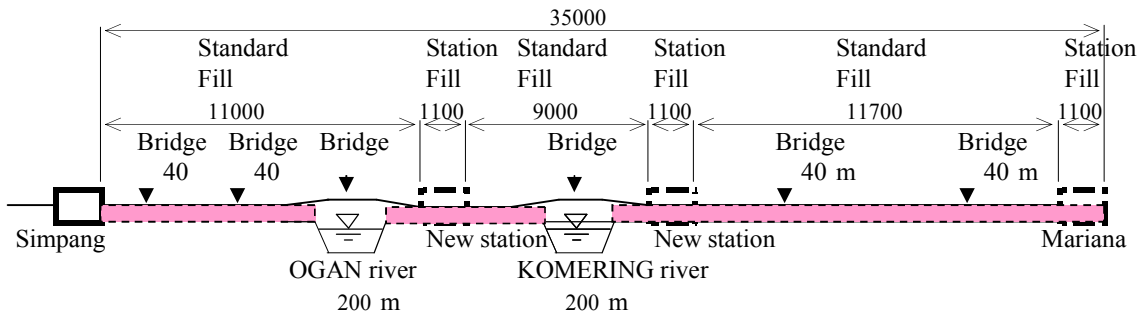
$$\begin{aligned}
 \text{Excavation Volume V} &= (B+b \times 2) \times (L+b \times 2) \times (H+h+0.30) \\
 &= (6.00 + 0.50 \times 2) \times (6.00 + 0.50 \times 2) \times (1.50 + 2.00 + 0.30) \\
 &= 186 \text{ m}^3/\text{place}
 \end{aligned}$$

4) U Shape Gutter and Catchment Drain

- Assumption ; (a) U-Shape Gutter is newly established on the side in the new establishment fill and the cut land.
 (b) The Catchment drain is made from the interval of 50m.

Station Name	Earth Fill Section				
	Width B(m)	Length L(m)	Gutter Length L(m)	Transverse Culvert L(m)	Catchment Drain no
Change Simpang 388km+500	-	-	-	-	-
↓	12.30	5,860	11,720	1,439	234
Gasing 433km+500	16.30	1,100	2,200	359	44
Sig~ Gasing Total		6,960	13,920	1,798	278

1.7.2. Design 5 - Construct Coal Handling Plant at Mariana far about 35km from Simpang



Assumption ; (1) Station Length is Proposed Train Length (1000m) + allowance (100m)

1) Roadbed and Earth Fill Quantity

Roadbed and Earth Fill Quantity Table

Station Name Change	Roadbed and Earth Fill Quantity Table					
	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Earth Fill volume Vf(m ³)	Soft subsoil measures A(m ²)	Slope Work A(m ²)
Simpang 388km+500	-	-	-	-	-	-
↓	2.00	10,720	30,016	169,376	131,856	77,303
New station	2.00	1,100	4,070	25,190	17,930	7,932
↓	2.00	8,800	24,640	139,040	108,240	63,458
New station	2.00	1,100	4,070	25,190	17,930	7,932
↓	2.00	11,620	32,536	183,596	142,926	83,793
Gasing 433km+500	2.00	1,100	4,070	25,190	17,930	7,932
Sig~ Mariana Total		34,440	99,402	567,582	436,812	248,350

2) Bridge Superstructure and Substructure Quantity

- Assumption
- (1) Because the existing bridge has been reinforced to the design load 18t correspondence, a new establishment bridge angle amount is calculated from the bridge list table.
 - (2) The number of bridges is presumed from 1/250,000 planes.
 - 50m×4 Truss × 2bridge
 - 40m Truss × 4bridge

(i) Superstructure; from Bridge List

	Unit	Bridge	1 bridge weight	Weight	Remarks
Truss(50m)	kg	8	130,000	1,040,000	Refer to BH.No915
Truss(40m)	kg	4	90,000	360,000	Refer to BH.No419

(ii) Substructure

(a)Concrete volume; from Bridge List

	Unit	place	One volume	Volume	Remarks
Pier	m ³	6	279	1,674	-
Abutment		10	204	2,040	Refer to BH.No718
Σ	-	16	-	3,714	-

(b) Foundation Excavation Volume

	Simpang~			Remarks
	place	Excavation Vm^3	Steel pipe Lm	
Pier	6	-	2,640	Steel pipe Yaita Iduts
Abutment	10	1,860	-	Direct base
Σ	-	1,860	2,640	

Pier ; Height $H=21m-10m=11m$, Steel pipe Sheet Pile $D=8.50m \times 20m$

$$\text{Pillar } V = 3.80 \times 3.80 \times \pi / 4 \times 11.00 + 6.80 \times 4.00 \times 2.00 = 179 \text{ m}^3/\text{place}$$

$$\text{Base } V = 6.50 \times 6.50 \times \pi / 4 \times 3.00 = 100 \text{ m}^3/\text{place}$$

$$\Sigma V = 279 \text{ m}^3/\text{place}$$

Steel pipe piling; $\phi 1000 \times 16 \times 28.00 \times 20$ pile

$$L = 28.00 \times 20 = 560 \text{ m/place}$$

$$W = 388 \times 28.00 \times 20 = 217,280 \text{ kg/place}$$

$$\text{Piling } L' = 22.00 \times 20 = 440 \text{ m/place}$$

Abutment ; from 1.3.1.

$$\text{Excavation Volume } V = 186 \text{ m}^3/\text{place}$$

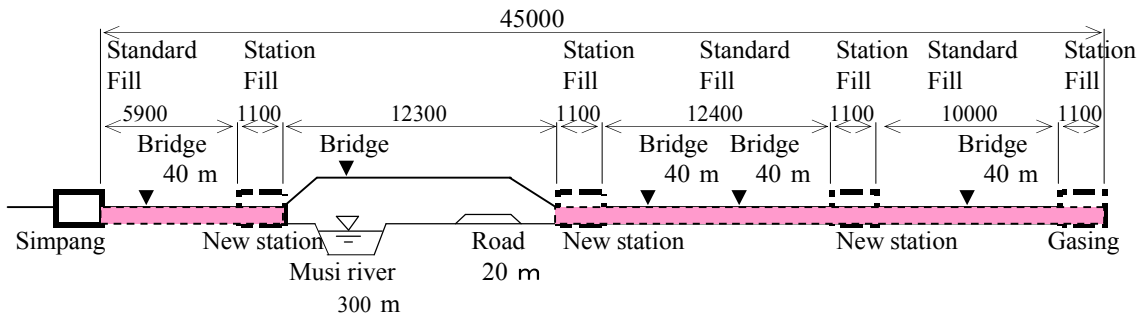
4) U Shape Gutter and Catchment Drain

Assumption ; (a) U-Shape Gutter is newly established on the side in the new establishment fill and the cut land.

(b) The Catchment drain is made from the interval of 50m.

Station Name	Earth Fill Section				
	Width B(m)	Length L(m)	Gutter Length L(m)	Transverse Culvert L(m)	Catchment Drain no
Changeage					
Simpang 388km+500	-	-	-	-	-
↓	12.30	10,720	21,440	2,632	428
New station	16.30	1,100	2,200	359	44
↓	12.30	8,800	17,600	2,165	352
New station	16.30	1,100	2,200	359	44
↓	12.30	11,620	23,240	2,854	464
Mariana 423km+500	16.30	1,100	2,200	359	44
Sig~ Mariana Total		34,440	68,880	8,728	1,376

1.7.3. Design 6 - Construct Coal Handling Plant at Gasing far about 45km from Simpang



Assumption ; (1) Station Length is Proposed Train Length (1000m) + allowance (100m)

1) Roadbed and Earth Fill Quantity

Roadbed and Earth Fill Quantity Table

Station Name Change	Roadbed and Earth Fill Quantity Table					
	Height h(m)	Length L(m)	Roadbed Volume Vsb(m ³)	Earth Fill volume Vf(m ³)	Soft subsoil measures A(m ²)	Slope Work A(m ²)
Simpang 388km+500	-	-	-	-	-	-
↓	2.00	5,860	16,408	92,588	72,078	42,257
New station	2.00	1,100	4,070	25,190	17,930	7,932
↓	-	-	-	-	-	-
New station	2.00	1,100	4,070	25,190	17,930	7,932
↓	2.00	12,320	34,496	194,656	151,536	88,841
New station	2.00	1,100	4,070	25,190	17,930	7,932
↓	2.00	9,960	27,888	157,368	122,508	71,823
Gasing 433km+500	2.00	1,100	4,070	25,190	17,930	7,932
Sig~ Gasing Total		32,540	95,072	545,372	417,842	234,649

2) Bridge Superstructure and Substructure Quantity

- Assumption
- (1) Because the existing bridge has been reinforced to the design load 18t correspondence, a new establishment bridge angle amount is calculated from the bridge list table.
 - (2) The number of bridges is presumed from 1/250,000 planes.
 - 60m×5 Truss × 1bridge
 - 40m Truss × 4bridge

(i) Superstructure; from Bridge List

	Unit	Bridge	1 bridge weight	Weight	Remarks
Truss(60m)	kg	5	195,000	975,000	Refer to BH.No998
Truss(40m)	kg	4	90,000	360,000	Refer to BH.No419

(ii) Substructure

(a) Concrete volume; from Bridge List

	Unit	place	One volume	Volume	Remarks
Pier	m ³	6	444	2,664	-
Abutment		8	204	1,632	Refer to BH.No718
Σ	-	14	-	4,296	-

(b) Foundation Excavation Volume

	Simpang~			Remarks
	place	Excavation Vm^3	Steel pipe Lm	
Pier	6	-	3,168	Steel pipe Yaita Iduts
Abutment	8	1,488	-	Direct base
Σ	-	1,488	3,168	

Pier ; Height H=21m , Steel pipe Sheet pile D=10.0m×20m

Pillar $V = 3.80 \times 3.80 \times \pi / 4 \times 21.00 + 6.80 \times 4.00 \times 2.00 = 293 \text{ m}^3/\text{place}$

Base $V = 8.00 \times 8.00 \times \pi / 4 \times 3.00 = 151 \text{ m}^3/\text{place}$

$\Sigma V = 444 \text{ m}^3/\text{place}$

Steel pipe paling; $\phi 1000 \times 16 \times 35.00 \times 24 \text{ pile}$

L = $35.00 \times 24 = 840 \text{ m}/\text{place}$

W = $388 \times 35.00 \times 24 = 325,920 \text{ kg}/\text{place}$

Piling L' = $22.00 \times 24 = 528 \text{ m}/\text{place}$

Abutment ; from 1.3.1.

Excavation Volume $V = 186 \text{ m}^3/\text{place}$

3) Viaduct

Assumption (1) It makes it to a digit type elevated bridge of the span 20m.
 Superstructure; Composite Girder(I shape girder), L=20m
 Substructure; Wall type pier + paling base(steel pipe paling)

$n = 12000 / 20 = 600 \text{ Bridge}$

(i) Superstructure; from Bridge List

	Unit	Bridge	1 bridge weight	Weight	Remarks
Composit beam (20m)	kg	600	25,000	15,000,000	BH.No725*20/15

(ii) Substructure

(a)Concrete volume; from Bridge List

	Unit	place	One volume	Volume	Remarks
Pier	m^3	600	59	35,400	-
Abutment		-	-	-	-
Σ	-	600	-	35,400	-

(b) Foundation Excavation Volume

	Simpang~			Remarks
	place	Excavation Vm^3	Steel pipe Lm	
Pier	600	32,400	27,600	Paling base
Abutment	-	-	-	
Σ	-	32,400	27,600	

※Assume as following dimension

Pier ; h=6.0m

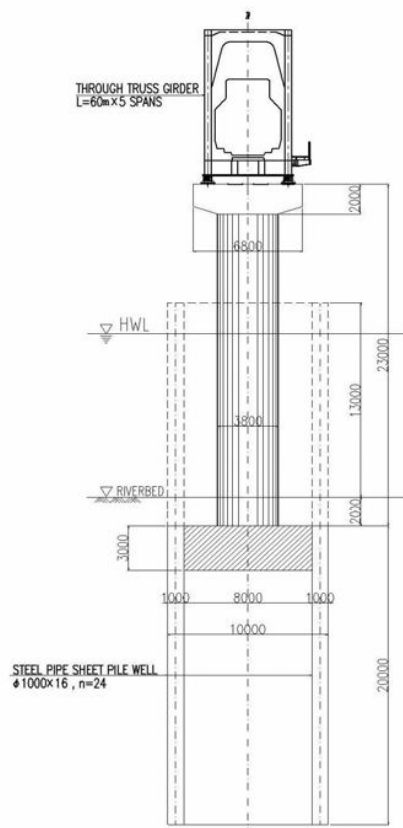
Pillar $V = 3.00 \times 1.50 \times 5.50 + 6.00 \times 1.50 \times 1.00 = 34 \text{ m}^3/\text{place}$

Base $V = 5.00 \times 5.00 \times 1.00 = 25 \text{ m}^3/\text{place}$

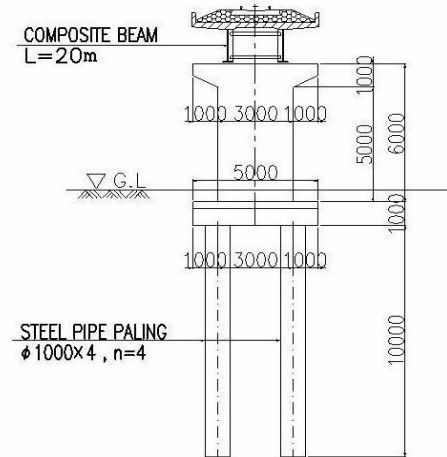
$\Sigma V = 59 \text{ m}^3/\text{place}$

Steel pipe piling;	$\phi 1000 \times 12 \times 10.00 \times 4$ 本		
	L = 10.00×4	=	40 m/place
	W = 292×10.00×4	=	11,680 kg/place
Piling	L' = 11.50×4	=	46 m/place
Excavation	V = 6.00×6.00×1.50	=	54 m ³ /place

Bridge crossing chart
60m+60m



Viaduct crossing chart
20m+20m



4) U Shape Gutter and Catchment Drain

- Assumption ; (a) U-Shape Gutter is newly established on the side in the new establishment fill and the cut land.
(b) The Catchment drain is made from the interval of 50m.

Station Name	Earth Fill Section				
	Width B(m)	Length L(m)	Gutter Length L(m)	Transverse Culvert L(m)	Catchment Drain no
Change	-	-	-	-	-
Simpang 388km+500	-	-	-	-	-
↓	12.30	5,860	11,720	1,439	234
New station	16.30	1,100	2,200	359	44
↓ Viaduct	12.30	-	-	-	-
New station	16.30	1,100	2,200	359	44
↓	12.30	12,320	24,640	3,026	492
New station	16.30	1,100	2,200	359	44
↓	12.30	9,960	19,920	2,448	398
Gasing 433km+500	16.30	1,100	2,200	359	44
Sig~ Gasing Total		32,540	65,080	8,349	1,300

※ Expense of construction 1 m comparison between Standard Earth Fill Section and Viaduct section

Standard Earth Fill Section

	Unit	Quantity	Unit price	Amount (Rp/m)	Remarks
Roadbed Work	m3	2.8	610,500	1,709,400	
Earth Fill Worker	m3	15.8	177,280	2,801,024	
Pile Net Worker	m2	12.3	1,462,164	17,984,617	
Vegetation Work	m2	7.2	66,000	475,200	
Total/1m				22,970,241	
				(1Rp=110 yen)	→ 209,000 Yen/m

Viaduct section

	Unit	Quantity	Unit price	Amount (Rp/m)	Remarks
Superstructure	t	25.0	71,500,000	1,787,500,000	※
Substructure	m3	59.0	1,943,115	114,643,785	
Basic construction	m3	54.0	690,695	37,297,530	
Steel pipe Sheet pile	m3	46.0	5,500,000	253,000,000	※
Total/20m				2,192,441,315	
Total/1m				109,622,066	
				(1Rp=110 yen)	→ 997,000 Yen/m
				※ Japanese Unit Price×110Rp	

Station fill

	Unit	Quantity	Unit price	Amount (Rp/m)	Remarks
Roadbed Work	m3	3.7	610,500	2,258,850	
Earth Fill Worker	m3	22.9	177,280	4,059,712	
Pile Net Worker	m2	16.3	1,462,164	23,833,273	
Vegetation Work	m2	7.2	66,000	475,200	
Total/1m				30,627,035	
				(1Rp=110 yen)	→ 278,000 Yen/m

2.Civil work cost

2.1. The first stage(Single track improvement,Target transportation amount 2.5 million ton/year,395m in train organization length)

2.1.1. Construction cost summary table

Work item	Foreign currency(Rp)	On inside(Rp)	Total price(Rp)
Existing sub ballast improvement Construction cost	0	48,053,065,500	48,053,065,500
Sub ballast Construction cost	0	518,925,000	518,925,000
Levelling the land Construction cost	0	52,169,352	52,169,352
Fill worker Construction cost	0	432,208,640	432,208,640
Cut worker Construction cost	0	298,732,500	298,732,500
Vegetation worker Construction cost	0	83,094,000	83,094,000
EARTH WORK TOTAL COST	0	866,204,492	866,204,492
Drain worker Construction cost	0	380,170,792	380,170,792
Ground improvement Construction cost(Pile net worker)	0	0	0
Superstructure worker Construction cost	0	0	0
Substructure worker Construction cost	0	0	0
BRIDGE TOTAL COST	0	50,684,570,276	50,684,570,276
Railload crossing Construction cost	0	0	0
CONSTRUCTION TOTAL COST	0	49,818,365,784	49,818,365,784

2.1.2. Construction expense breakdown table

The first stage(Single track improvement,Target transportation amount 2.5 million ton/year,395m in train organization length)

1/1

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	1.EARTH WORKS(Lahat~Muaraenim,PbrX6~Kertapati)					
	1.1. Existing sub ballast improvement	m ³	78,711.00	610,500.00	48,053,065,500.00	Reinforced roadbed
	1.2. Existing station improvement(L>395m)					
	1.2.1. Land preparation	m ²	3,396.00	15,362.00	52,169,352.00	
	1.2.2. New sub ballast					
	(1) Fill section	m ³	542.00	610,500.00	330,891,000.00	Reinforced roadbed
	(2) Cut section	m ³	308.00	610,500.00	188,034,000.00	Reinforced roadbed
	1.2.3. Fill worker	m ³	2,438.00	177,280.00	432,208,640.00	Purchase soil use
	1.2.4. Pile net worker(Between Pyk-Kpt.)	m ²	0.00	1,462,164.00	0.00	Soft ground measures
	1.2.5. Cut worker	m ³	1,207.00	247,500.00	298,732,500.00	
	1.2.6. Vegetation worker					
	(1) Fill section	m ²	898.00	66,000.00	59,268,000.00	
	(2) Cut section	m ²	361.00	66,000.00	23,826,000.00	
	1.EARTH WORKS TOTAL COST				49,438,194,992.00	
	2.DRAIN WORKER(Lahat~Muaraenim,PbrX6~Kertapati)					
	2.1. Existing station improvement(L>395m)					
	2.1.1.U type side ditch(direction of railway track)					
	(1) Fill section	m	258.00	591,512.00	152,610,096.00	
	(2) Cut section	m	308.00	591,512.00	182,185,696.00	
	2.1.2.Catchmento					
	(1) Fill section	no	5.00	4,125,000.00	20,625,000.00	
	(2) Cut section	no	6.00	4,125,000.00	24,750,000.00	
	2.DRAIN WORKER TOTAL COST				380,170,792.00	
	Lahat~Muaraenim,PbrX6~Kertapati section EARTHWORK TOTAL COST				49,818,365,784.00	Rp

[4.5 hundred million yen]

2.2. The second stage (Target transportation amount 5 million ton/year,615m in train organization length)

2.2.1. Construction cost summary table

Work item	Foreign currency(Rp)	On inside(Rp)	Total price(Rp)
Existing sub ballast improvement Construction cost	0	48,053,065,500	48,053,065,500
Sub ballast Construction cost	0	7,666,659,000	7,666,659,000
Levelling the land Construction cost	0	675,282,796	675,282,796
Fill worker Construction cost	0	6,630,626,560	6,630,626,560
Cut worker Construction cost	0	3,178,642,500	3,178,642,500
Vegetation worker Construction cost	0	1,281,522,000	1,281,522,000
EARTH WORK TOTAL COST	0	11,766,073,856	11,766,073,856
Drain worker Construction cost	0	22,394,220,958	22,394,220,958
Ground improvement Construction cost(Pile net worker)	0	6,141,088,800	6,141,088,800
Superstructure worker Construction cost	0	0	0
Substructure worker Construction cost	0	0	0
BRIDGE TOTAL COST	0	0	0
Railroad crossing Construction cost	0	2,700,000,000	2,700,000,000
Me-Pbr X6 double-track line making Construction cost	25,000,000,000	224,860,835,878	249,860,835,878
CONSTRUCTION TOTAL COST	25,000,000,000	323,581,943,992	348,581,943,992

2.2.2. Construction expense breakdown table

The second stage (Target transportation amount 5 million ton/year, 615m in train organization length)

1/3

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	1.EARTH WORKS (Lahat~Muaraenim,Pbr,X6~Kertapati)					
	1.1. Existing sub ballast improvement	m ³	78,711.00	610,500.00	48,053,065,500.00	Reinforced roadbed
	1.2. Existing station improvement(L>615m)					
	1.2.1. Land preparation	m ²	14,418.00	15,362.00	221,489,316.00	
	1.2.2. New sub ballast					
	(1) Fill section	m ³	2,892.00	610,500.00	1,765,566,000.00	Reinforced roadbed
	(2) Cut section	m ³	1,026.00	610,500.00	626,373,000.00	Reinforced roadbed
	1.2.3. Fill worker	m ³	12,182.00	177,280.00	2,159,624,960.00	Purchase soil use
	1.2.4. Pile net worker(Between Pyk~Kpt)	m ²	0.00	1,462,164.00	0.00	Soft ground measures
	1.2.5. Cut worker	m ³	9,393.00	247,500.00	2,324,767,500.00	
	1.2.6. Vegetation worker					
	(1) Fill section	m ²	4,518.00	66,000.00	298,188,000.00	
	(2) Cut section	m ²	2,830.00	66,000.00	186,780,000.00	
	1.3. New station(L=700m)					
	1.3.1.Land preparation	m ²	8,400.00	15,362.00	129,040,800.00	Purchase soil use
	1.3.2.New sub ballast					
	(1) Fill section	m ³	2,310.00	610,500.00	1,410,255,000.00	Reinforced roadbed
	(2) Cut section	m ³	300.00	610,500.00	183,150,000.00	Reinforced roadbed
	1.3.3.Fill worker	m ³	12,810.00	177,280.00	2,270,956,800.00	Purchase soil use
	1.3.4.Pile net worker (Btween Pyk~Kpt)	m ²	4,200.00	1,462,164.00	6,141,088,800.00	Soft ground measures
	1.3.5.Cut worker	m ³	3,450.00	247,500.00	853,875,000.00	
	1.3.6.Vegetation worker					
	(1) Fill section	m ²	4,541.00	66,000.00	299,706,000.00	
	(2) Cut section	m ²	1,038.00	66,000.00	68,508,000.00	

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	2.2.New station (L=700m)					
	2.2.1.U type side ditch (direction of railway track)					
	(1) Fill section	m	1,100.00	591,512.00	650,663,200.00	
	(2) Cut section	m	300.00	591,512.00	177,453,600.00	
	2.2.2.Catchmento					
	(1) Fill section	no	22.00	4,125,000.00	90,750,000.00	
	(2) Cut section	no	6.00	4,125,000.00	24,750,000.00	
	2.2.3.Crossing drain (Increase length L=6.0m/no)					
	(1) Concrete pipe	no	1.00	17,488,692.00	17,488,692.00	with the Hume pipe
	(2) Box culvert,U type	no	2.00	2,622,431,256.00	5,244,862,512.00	Box <2m
	2.3.New line construction (Merapi~Coal yard L=700m)					
	2.3.1.U type side ditch (direction of railway track)	m	3,600.00	591,512.00	2,129,443,200.00	
	2.3.2.Catchmento	no	72.00	4,125,000.00	297,000,000.00	
	2.3.3.Crossing drain	m	531.00	2,914,782.00	1,547,749,242.00	with the Hume pipe
	2.DRAIN WORKER TOTAL COST				22,394,220,958.00	
	3.RAILLOAD CROSSING (Lahat~Muaraenim,PbrX6~Ke					
	3.1.Existing station improvement (L>930m)					
	3.1.1. Railload crossing	no	9.00	300,000,000.00	2,700,000,000.00	1no/st.(Assumption
	3.RAILLOAD CROSSING TOTAL COST				2,700,000,000.00	
	4.Construction of making to double-track line section (Muaraenim~PbrX6)EARTHWORK COST	k m	28.20	8,860,313,329.00	249,860,835,878.00	Refer to 2.3.
	4.Construction of making to double-track line section (Muaraenim~PbrX6)EARTHWORK TOTAL COST				(25,000,000,000.00)	(Foreign currency 10%)
					249,860,835,878.00	
	Lahat~Muaraenim,PbrX6~Kertapati section EARTHWORK TOTAL COST				348,581,943,992.00	Rp
						[31.7 hundred million yen]

2.3. The third stage (Complete double-track line making, 930m in train organization length during target transportation amount 20 million ton/year)

2.3.1. Construction cost summary table

Work item	Foreign currency(Rp)	On inside(Rp)	Total price(Rp)
Existing sub ballast improvement Construction cost	0	48,053,065,500	48,053,065,500
Sub ballast Construction cost	0	158,717,179,500	158,717,179,500
Levelling the land Construction cost	0	11,996,400,868	11,996,400,868
Fill worker Construction cost	0	105,348,108,160	105,348,108,160
Cut worker Construction cost	0	167,808,712,500	167,808,712,500
Vegetation worker Construction cost	0	28,163,718,000	28,163,718,000
EARTH WORK TOTAL COST	0	313,316,939,528	313,316,939,528
Drain worker Construction cost	0	332,881,106,002	332,881,106,002
Ground improvement Construction cost(Pile net worker)	0	205,796,658,672	205,796,658,672
Superstructure worker Construction cost	103,093,171,500	533,784,665	103,626,956,165
Substructure worker Construction cost	33,379,000,000	69,737,468,935	103,116,468,935
BRIDGE TOTAL COST	136,472,171,500	70,271,253,600	206,743,425,100
Railroad crossing Construction cost	0	15,600,000,000	15,600,000,000
Me-Pbr X6 double-track line making Construction cost	25,000,000,000	224,860,835,878	249,860,835,878
CONSTRUCTION TOTAL COST	161,472,171,500	1,369,497,038,680	1,530,969,210,180

2.3.2. Construction expense breakdown table

The third stage (Complete double-track line making,930m in train organization length during target transportation amount 20 million ton/year)

1/4

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	1.EARTH WORKS (Lahat~Muaraenim,Pbr.X6~Kertapati)					
	1.1. Existing sub ballast improvement	m ³	78,711.00	610,500.00	48,053,065,500.00	Reinforced roadbed
	1.2. Existing station improvement(L>930m)					
	1.2.1. Land preparation	m ²	34,386.00	15,362.00	528,237,732.00	
	1.2.2. New sub ballast					
	(1) Fill section	m ³	5,599.00	610,500.00	3,418,189,500.00	Reinforced roadbed
	(2) Cut section	m ³	5,824.00	610,500.00	3,555,552,000.00	Reinforced roadbed
	1.2.3. Fill worker	m ³	20,564.00	177,280.00	3,645,585,920.00	Purchase soil use
	1.2.4. Pile net worker(Between Pyk-Kpt.)	m ²	2,934.00	1,462,164.00	4,289,989,176.00	Soft ground measures
	1.2.5. Cut worker	m ³	43,655.00	247,500.00	10,804,612,500.00	
	1.2.6. Vegetation worker					
	(1) Fill section	m ²	7,882.00	66,000.00	520,212,000.00	
	(2) Cut section	m ²	13,095.00	66,000.00	864,270,000.00	
	1.3.New station (L=1,000m)					
	1.3.1.Land preparation	m ²	12,000.00	15,362.00	184,344,000.00	
	1.3.2.New sub ballast					
	(1) Fill section	m ³	3,570.00	610,500.00	2,179,485,000.00	Reinforced roadbed
	(2) Cut section	m ³	570.00	610,500.00	347,985,000.00	Reinforced roadbed
	1.3.3.Fill worker	m ³	17,310.00	177,280.00	3,068,716,800.00	Purchase soil use
	1.3.4.Pile net worker (Btween Pyk~Kpt)	m ²	6,000.00	1,462,164.00	8,772,984,000.00	Soft ground measures
	1.3.5.Cut worker	m ³	3,450.00	247,500.00	853,875,000.00	
	1.3.6.Vegetation worker					
	(1) Fill section	m ²	6,283.00	66,000.00	414,678,000.00	
	(2) Cut section	m ²	1,038.00	66,000.00	68,508,000.00	

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	1.4.New line construction (Merapi~Coal yard L=700m)					
	1.4.1.Land preparation	m ²	21,140.00	15,362.00	324,752,680.00	
	1.4.2.New sub ballast	m ³	6,030.00	610,500.00	3,681,315,000.00	Reinforced roadbed
	1.4.3.Fill worker	m ³	12,410.00	177,280.00	2,200,044,800.00	Purchase soil use
	1.4.4.Pile net worker (Btween Pyk~Kpt)	m ²	0.00	1,462,164.00	0.00	Soft ground measures
	1.4.5. Vegetation worker	m ²	6,490.00	66,000.00	428,340,000.00	
	1.5.Double track line construction (Lahat~Muaraenim,Pt)					
	1.5.1.Levelling the land	m ²	713,388.00	15,362.00	10,959,066,456.00	
	1.5.2.New sub ballast					
	(1) Fill section	m ³	131,036.00	610,500.00	79,997,478,000.00	Reinforced roadbed
	(2) Cut section	m ³	107,350.00	610,500.00	65,537,175,000.00	Reinforced roadbed
	1.5.3.Fill worker	m ³	543,963.00	177,280.00	96,433,760,640.00	Purchase soil use
	1.5.4.Pile net worker (Btween Pyk~Kpt)	m ²	131,814.00	1,462,164.00	192,733,685,496.00	Soft ground measures
	1.5.5.Cut worker	m ³	630,910.00	247,500.00	156,150,225,000.00	
	1.5.6. Vegetation worker					
	(1) Fill section	m ²	202,481.00	66,000.00	13,363,746,000.00	
	(2) Cut section	m ²	189,454.00	66,000.00	12,503,964,000.00	
	1.EARTH WORKS TOTAL COST				725,883,843,200.00	
	2.BRIDGE WORKS (Lahat~Muaraenim,PbrX6~Kertapati)					
	2.1.Superstructure worker					
	2.1.1.Steel girder (Truss)	t	846.75	99,000,000.00	83,827,854,000.00	※ 1
	2.1.2.Steel girder (I beam,Plate girder)	t	269.45	71,500,000.00	19,265,317,500.00	※ 1
	2.1.3.RC girder	m ³	13.00	2,159,777.00	28,077,101.00	
	2.1.4.H burial girder	m ³	31.00	6,600,000.00	204,600,000.00	
	2.1.5.Bearing and installation	no	108.00	2,788,033.00	301,107,564.00	

※ 1 ; Japanese unit prise×110Rp

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	2.2.Substructure worker					
	2.2.1.Pier • Abutment	m ³	10,807.00	1,943,115.00	20,999,243,805.00	
	2.2.2.Basic construction test digging	m ³	9,734.00	690,695.00	6,723,225,130.00	
	2.3.Temporary housing construction (road and pier for construction)	set	1.00	75,394,000,000.00	75,394,000,000.00	
					(33,379,000,000.00)	(Foreign currency)
	2.BRIDGE WORKS TOTAL COST					
					206,743,425,100.00	
	3.DRAIN WORKER (Lahat~Muaraenim,PbrX6~Kertapa)					
	3.1.Existing station improvement (L>930m)					
	3.1.1.U type side ditch (direction of railway track)					
	(1) Fill section	m	2,666.00	591,512.00	1,576,970,992.00	
	(2) Cut section	m	3,065.00	591,512.00	1,812,984,280.00	
	3.1.2.Catchment					
	(1) Fill section	no	44.00	4,125,000.00	181,500,000.00	
	(2) Cut section	no	42.00	4,125,000.00	173,250,000.00	
	3.1.3.Crossing drain (Increase length L=6.0m/no)					
	(1) Concrete pipe	no	8.00	17,488,692.00	139,909,536.00	with the Hume pipe
	(2) Box culvert,U type	no	9.00	2,622,431,256.00	23,601,881,304.00	Box <2m
	3.2.New station (L=1,000m)					
	3.2.1.U type side ditch (direction of railway track)					
	(1) Fill section	m	1,700.00	591,512.00	1,005,570,400.00	
	(2) Cut section	m	300.00	591,512.00	177,453,600.00	
	3.2.2.Catchment					
	(1) Fill section	no	34.00	4,125,000.00	140,250,000.00	
	(2) Cut section	no	6.00	4,125,000.00	24,750,000.00	
	3.2.3.Crossing drain (Increase length L=6.0m/no)					
	(1) Concrete pipe	no	2.00	17,488,692.00	34,977,384.00	with the Hume pipe
	(2) Box culvert,U type	no	3.00	2,622,431,256.00	7,867,293,768.00	Box <2m

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	3.3.New line construction (Merapi~Coal yard L=700m					
	3.3.1.U type side ditch (direction of railway track)	m	3,600.00	591,512.00	2,129,443,200.00	
	3.3.2.Catchmento	no	72.00	4,125,000.00	297,000,000.00	
	3.3.3.Crossing drain	m	531.00	2,914,782.00	1,547,749,242.00	with the Hume pipe
	3.4.Double track line construction (Lahat~Muaraenim,Pi					
	3.4.1.U type side ditch (direction of railway track)					
	(1) Fill section	m	62,395.00	591,512.00	36,907,391,240.00	
	(2) Cut section	m	56,500.00	591,512.00	33,420,428,000.00	
	3.4.2.Catchmento					
	(1) Fill section	no	1,248.00	4,125,000.00	5,148,000,000.00	
	(2) Cut section	no	1,130.00	4,125,000.00	4,661,250,000.00	
	3.4.3.Crossing drain (Increase length L=6.0m/no)					
	(1) Concrete pipe	no	128.00	17,488,692.00	2,238,552,576.00	with the Hume pipe
	(2) Box culvert,U type	no	80.00	2,622,431,256.00	209,794,500,480.00	Box < 2m
	3.DRAIN WORKER TOTAL COST				332,881,106,002.00	
	4.RAILROAD CROSSING (Lahat~Muaraenim,PbrX6~Ke					
	4.1.Existing station improvement (L>930m)					
	4.1.1. Railload crossing	no	13.00	300,000,000.00	3,900,000,000.00	1no/st.(Assumption
	4.2.Double track line construction					
	4.2.1. Railload crossing	no	39.00	300,000,000.00	11,700,000,000.00	3no/st.(Assumption
	4.RAILROAD CROSSING TOTAL COST				15,600,000,000.00	
	5.Construction of making to double-track line section	k m	28.20	8,860,313,329.00	249,860,835,878.00	Refer to 2.4.2..
	(Muaraenim~PbrX6)EARTHWORK COST				(25,000,000,000.00)	(Foreign currency 10%)
	5.Construction of making to double-track line section (Muaraenim~PbrX6)EARTHWORK TOTAL COST				249,860,835,878.00	
	Lahat~Muaraenim,PbrX6~Kertapati section EARTHWORK TOTAL COST				1,530,969,210,180.00	Rp
						{ 139.2 hundred million yen}

2.4. Whole line double-track line making(Only making Lahat-Muaraenim and PbrX6-Kertapati a double-track line)

;For the construction of making to double-track line expense calculation between Muaraenim-PbrX6

2.4.1. Construction cost summary table

Work item	Foreign currency(Rp)	On inside(Rp)	Total price(Rp)
Existing sub ballast improvement Construction cost	0	0	0
Sub ballast Construction cost			
1 industrial sector;Lt~Me	0	47,873,578,500	
2 industrial sectors;X6~Pyk	0	65,319,837,000	145,534,653,000
3 industrial sectors;Pyk~Kpt	0	32,341,237,500	
Land preparation Construction cost			
1 industrial sector;Lt~Me	0	3,608,165,112	
2 industrial sectors;X6~Pyk	0	4,994,155,476	10,959,066,456
3 industrial sectors;Pyk~Kpt	0	2,356,745,868	
Fill worker Construction cost			
1 industrial sector;Lt~Me	0	40,713,592,960	
2 industrial sectors;X6~Pyk	0	26,421,279,360	96,433,760,640
3 industrial sectors;Pyk~Kpt	0	29,298,888,320	
Cut worker Construction cost			
1 industrial sector;Lt~Me	0	65,905,537,500	
2 industrial sectors;X6~Pyk	0	79,463,587,500	156,150,225,000
3 industrial sectors;Pyk~Kpt	0	10,781,100,000	
Vegetation workerConstruction cost			
1 industrial sector;Lt~Me	0	8,519,148,000	
2 industrial sectors;X6~Pyk	0	11,846,736,000	25,867,710,000
3 industrial sectors;Pyk~Kpt	0	5,501,826,000	
EARTH WORK TOTAL COST 1 industrial sector;Lt~Me	0	118,746,443,572	
2 industrial sectors;X6~Py	0	122,725,758,336	289,410,762,096
3 industrial sectors;Pyk~K	0	47,938,560,188	
Ground improvement Construction cost(Pile net worker)			
1 industrial sector;Lt~Me	0	0	
2 industrial sectors;X6~Pyk	0	0	192,733,685,496
3 industrial sectors;Pyk~Kpt	0	192,733,685,496	
Drain worker Construction cost			
1 industrial sector;Lt~Me	0	119,849,212,144	
2 industrial sectors;X6~Pyk	0	136,610,999,724	292,171,896,832
3 industrial sectors;Pyk~Kpt	0	35,711,684,964	

1/2

Work item	Foreign currency(Rp)	On inside(Rp)	Total price(Rp)
Superstructure worker Construction cost			
1 industrial sector;Lt~Me	70,398,504,000	355,350,553	
2 industrial sectors;X6~Pyk	1,338,623,000	11,152,132	103,626,956,165
3 industrial sectors;Pyk~Kpt	31,356,044,500	167,281,980	
Substructure worker Construction cost			
1 industrial sector;Lt~Me	0	14,420,518,345	
2 industrial sectors;X6~Pyk	0	816,555,660	27,722,468,935
3 industrial sectors;Pyk~Kpt	0	12,485,394,930	
BRIDGE TOTAL COST 1 industrial sector;Lt~Me	70,398,504,000	14,775,868,898	131,349,425,100
2 industrial sectors;X6~Pyk	1,338,623,000	827,707,792	
3 industrial sectors;Pyk~Kpt	31,356,044,500	12,652,676,910	
Railroad crossing Construction cost			
1 industrial sector;Lt~Me	0	159,621,408	
2 industrial sectors;X6~Pyk	0	279,337,464	518,769,576
3 industrial sectors;Pyk~Kpt	0	79,810,704	
CONSTRUCTION TOTAL COST	103,093,171,500	948,626,020,600	1,051,719,192,100

Ratio of foreign currencies in Lahat-Muaraenim and Pbr;X6-Kertapati whole line double-track line making idea

$$\text{Ratio of foreign currencies} = 103,093,171,500 / 1,051,719,192,100 \times 100 = 10 \%$$

2.4.2. Construction expense breakdown table

Whole line double-track line making(Only making Lahat-Muaraenim and PbrX6-Kertapati a double-track line)
 ;For the construction of making to double-track line expense calculation between Muaraenim-PbrX6

1/5

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	1.EARTH WORKS (Lahat~Muaraenim,PbrX6~Kertapati)					
	1.1. Existing sub ballast improvement	m ³	0.00	610,500.00	0.00	Reinforced roadbed
	1.2.Land preparation					
	1 industrial sector;Lt~Me	m ²	234,876.00	15,362.00	3,608,165,112.00	
	2 industrial sectors;X6~Pyk	m ²	325,098.00	15,362.00	4,994,155,476.00	
	3 industrial sectors;Pyk~Kpt	m ²	153,414.00	15,362.00	2,356,745,868.00	
	Total		713,388.00		10,959,066,456.00	
	1.3.New sub ballast					
	1.3.1.Fill section					
	1 industrial sector;Lt~Me	m ³	42,412.00	610,500.00	25,892,526,000.00	Reinforced roadbed
	2 industrial sectors;X6~Pyk	m ³	42,489.00	610,500.00	25,939,534,500.00	Reinforced roadbed
	3 industrial sectors;Pyk~Kpt	m ³	46,135.00	610,500.00	28,165,417,500.00	Reinforced roadbed
	Total		131,036.00		79,997,478,000.00	
	1.3.2.Cut section					
	1 industrial sector;Lt~Me	m ³	36,005.00	610,500.00	21,981,052,500.00	Reinforced roadbed
	2 industrial sectors;X6~Pyk	m ³	64,505.00	610,500.00	39,380,302,500.00	Reinforced roadbed
	3 industrial sectors;Pyk~Kpt	m ³	6,840.00	610,500.00	4,175,820,000.00	Reinforced roadbed
	Total		107,350.00		65,537,175,000.00	
	1.4.Fill worker					
	1 industrial sector;Lt~Me	m ³	229,657.00	177,280.00	40,713,592,960.00	Purchase soil use
	2 industrial sectors;X6~Pyk	m ³	149,037.00	177,280.00	26,421,279,360.00	Purchase soil use
	3 industrial sectors;Pyk~Kpt	m ³	165,269.00	177,280.00	29,298,888,320.00	Purchase soil use
	Total		543,963.00		96,433,760,640.00	
	1.5.Pile net worker (Btween Pyk~Kpt)					
	1 industrial sector;Lt~Me	m ²	0.00	1,462,164.00	0.00	Soft ground measures
	2 industrial sectors;X6~Pyk	m ²	0.00	1,462,164.00	0.00	Soft ground measures
	3 industrial sectors;Pyk~Kpt	m ²	131,814.00	1,462,164.00	192,733,685,496.00	Soft ground measures
	Total		131,814.00		192,733,685,496.00	

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation	
	1.6.Cut worker						
	1 industrial sector;Lt~Me	m ³	266,285.00	247,500.00	65,905,537,500.00		
	2 industrial sectors;X6~Pyk	m ³	321,065.00	247,500.00	79,463,587,500.00		
	3 industrial sectors;Pyk~Kpt	m ³	43,560.00	247,500.00	10,781,100,000.00		
	Total		630,910.00		156,150,225,000.00		
	1.7.Vegetation worker						
	1.7.1.Fill section						
	1 industrial sector;Lt~Me	m ²	65,536.00	66,000.00	4,325,376,000.00		
	2 industrial sectors;X6~Pyk	m ²	65,656.00	66,000.00	4,333,296,000.00		
	3 industrial sectors;Pyk~Kpt	m ²	71,289.00	66,000.00	4,705,074,000.00		
	Total		202,481.00		13,363,746,000.00		
	1.7.2.Cut section						
	1 industrial sector;Lt~Me	m ²	63,542.00	66,000.00	4,193,772,000.00		
	2 industrial sectors;X6~Pyk	m ²	113,840.00	66,000.00	7,513,440,000.00		
	3 industrial sectors;Pyk~Kpt	m ²	12,072.00	66,000.00	796,752,000.00		
	Total		189,454.00		12,503,964,000.00		
	1.EARTH WORKS TOTAL COST						
					627,679,100,592.00		
	2.BRIDGE WORKS (Lahat~Muaraenim,PbrX6~Kertapati)						
	2.1.Superstructure worker						
	2.1.1.Steel girder (Truss)						
	1 industrial sector;Lt~Me	t	711.10	99,000,000.00	70,398,504,000.00	※ 1	
	2 industrial sectors;X6~Pyk	t	0.00	99,000,000.00	0.00	※ 1	
	3 industrial sectors;Pyk~Kpt	t	135.65	99,000,000.00	13,429,350,000.00	※ 1	
	Total		846.75		83,827,854,000.00		
	2.1.2.Steel girder (I beam,Plate girder)						
	1 industrial sector;Lt~Me	t	0.00	71,500,000.00	0.00	※ 1	
	2 industrial sectors;X6~Pyk	t	18.72	71,500,000.00	1,338,623,000.00	※ 1	
	3 industrial sectors;Pyk~Kpt	t	250.72	71,500,000.00	17,926,694,500.00	※ 1	
	Total		269.45		19,265,317,500.00		
	※ 1 ; Japanese unit prise×110Rp						

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	3.3.2.Box culvert,U type					
	1 industrial sector;Lt~Me	no	35.00	2,622,431,256.00	91,785,093,960.00	Box <2m
	2 industrial sectors;X6~Pyk	no	38.00	2,622,431,256.00	99,652,387,728.00	Box <2m
	3 industrial sectors;Pyk~Kpt	no	7.00	2,622,431,256.00	18,357,018,792.00	Box <2m
	Total		80.00		209,794,500,480.00	
	3.DRAIN WORKER TOTAL COST					
					292,171,896,832.00	
	4.RAILROAD CROSSING (Lahat~Muaraenim,PbrX6~Ke					
	4.1.Railroad crossing					6m×6m×39no
	1 industrial sector;Lt~Me	m ²	432.00	369,494.00	159,621,408.00	12no
	2 industrial sectors;X6~Pyk	m ²	756.00	369,494.00	279,337,464.00	21no
	3 industrial sectors;Pyk~Kpt	m ²	216.00	369,494.00	79,810,704.00	6no
	Total		1,404.00		518,769,576.00	
	4.RAILROAD CROSSING TOTAL COST					
					518,769,576.00	
	Lahat~Muaraenim,PbrX6~Kertapati section EARTHWORK TOTAL COST					
					1,051,719,192,100.00	Rp

[95.6 hundred million yen]

- Lahat~Muaraenim,PbrX6~Kertapati $\Sigma L = 118.7$ km
Cost of construction / 1 km = $1,051,719,192,100 / 118.7 = 8,860,313,329$ Rp/km
- Muaraenim~PbrX6 $\Sigma L = 70.6$ km $\times 40\%$ (assumption between industrial sectors to arrive) = 28.2 km
∴ **Lahat~Muaraenim,PbrX6~Kertapati section EARTHWORK = $8,860,313,329 \times 28.2 = 249,860,835,878$ Rp** [22.7 hundred million yen]
- Ratio of foreign currencies in Lahat-Muaraenim and PbrX6-Kertapati whole line double-track line making idea
Ratio of foreign currencies = $(83,827,854,000 + 19,265,317,500) / 1,051,719,192,100 \times 100 = 10\%$

2.5. ④ idea: The coal unloading equipment is constructed in Musi river away from Simpang at about 7km.

2.5.1. Construction cost summary table

Work item	Foreign currency(Rp)	On inside(Rp)	Total price(Rp)
Existing sub ballast improvement Construction cost	0	0	0
Sub ballast Construction cost	0	12,501,819,000	12,501,819,000
Levelling the land Construction cost	0	1,382,702,896	1,382,702,896
Fill worker Construction cost	0	20,879,683,840	20,879,683,840
Cut worker Construction cost	0	0	0
Vegetation worker Construction cost	0	3,312,474,000	3,312,474,000
EARTH WORK TOTAL COST	0	25,574,860,736	25,574,860,736
Drain worker Construction cost	0	14,621,375,076	14,621,375,076
Ground improvement Construction cost(Pile net worker)	0	131,606,457,312	131,606,457,312
Superstructure worker Construction cost	8,910,000,000	0	8,910,000,000
Substructure worker Construction cost	0	1,049,729,460	1,049,729,460
BRIDGE TOTAL COST	8,910,000,000	210,929,102,320	219,839,102,320
Railload crossing Construction cost	0	0	0
CONSTRUCTION TOTAL COST	8,910,000,000	185,354,241,584	194,264,241,584

2.5.2. Construction expense breakdown table

④ idea: The coal unloading equipment is constructed in Musi river away from Simpang at about 7km.

1/1

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	1.EARTH WORKS (Simpang~AIR MUSI)					
	1.1.New sub ballast	m ³	20,478.00	610,500.00	12,501,819,000.00	Reinforced roadbed
	1.2.Levelling the land	m ²	90,008.00	15,362.00	1,382,702,896.00	
	1.3.Fill worker	m ³	117,778.00	177,280.00	20,879,683,840.00	Purchase soil use
	1.4.Pile net worker (Btween Pyk~Kpt)	m ²	90,008.00	1,462,164.00	131,606,457,312.00	Soft ground measures
	1.5.Vegetation worker	m ²	50,189.00	66,000.00	3,312,474,000.00	
	1.EARTH WORKS TOTAL COST					
					169,683,137,048.00	
	2.BRIDGE WORKS					
	2.1.Superstructure worker					
	2.1.1.Steel girder (40m Truss)	t	90.00	99,000,000.00	8,910,000,000.00	※1
	2.2.Substructure worker					
	2.2.1.Pier・Abutment	m ³	408.00	1,943,115.00	792,790,920.00	
	2.2.2.Basic construction tesi digging	m ³	372.00	690,695.00	256,938,540.00	
	2.BRIDGE WORKS TOTAL COST					
					9,959,729,460.00	
	3.DRAIN WORKER					
	3.1.U type side ditch (direction of railway track)					
	3.2.Catchmento	no	278.00	4,125,000.00	1,146,750,000.00	
	3.3.Crossing drain	m	1,798.00	2,914,782.00	5,240,778,036.00	with the Hume pipe
	3.DRAIN WORKER TOTAL COST					
					14,621,375,076.00	
	Simpang~AIR MUSI new line section EARTHWORK TOTAL COST					
					194,264,241,584.00	Rp

{ 17.7 hundred million yen}

※1; Japanese unit prise×110Rp

2.6. ⑤ idea: The coale unloading equipment is constructed in Mariana away from Simpang at about 35km.

2.6.1. Construction cost summary table

Work item	Foreign currency(Rp)	On inside(Rp)	Total price(Rp)
Existing sub ballast improvement Construction cost	0	0	0
Sub ballast Construction cost	0	60,684,921,000	60,684,921,000
Levelling the land Construction cost	0	6,710,305,944	6,710,305,944
Fill worker Construction cost	0	100,620,936,960	100,620,936,960
Cut worker Construction cost	0	0	0
Vegetation worker Construction cost	0	16,391,100,000	16,391,100,000
EARTH WORK TOTAL COST	0	123,722,342,904	123,722,342,904
Drain worker Construction cost	0	71,859,563,856	71,859,563,856
Ground improvement Construction cost(Pile net worker)	0	638,690,781,168	638,690,781,168
Superstructure worker Construction cost	150,040,000,000	0	150,040,000,000
Substructure worker Construction cost	0	23,021,421,810	23,021,421,810
BRIDGE TOTAL COST	150,040,000,000	1,041,701,373,642	1,191,741,373,642
Railload crossing Construction cost	0	0	0
CONSTRUCTION TOTAL COST	150,040,000,000	917,979,030,738	1,068,019,030,738

2.6.2. Construction expense breakdown table

⑤ idea: The coale unloading equipment is constructed in Mariana away from Simpong at about 35km.

1/1

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	1.EARTH WORKS (Simpong~Mariana)					
	1.1.New sub ballast	m ³	99,402.00	610,500.00	60,684,921,000.00	Reinforced roadbed
	1.2.Levelling the land	m ²	436,812.00	15,362.00	6,710,305,944.00	
	1.3.Fill worker	m ³	567,582.00	177,280.00	100,620,936,960.00	Purchase soil use
	1.4.Pile net worker (Btween Pyk~Kpt)	m ²	436,812.00	1,462,164.00	638,690,781,168.00	Soft ground measures
	1.5.Vegetation worker	m ²	248,350.00	66,000.00	16,391,100,000.00	
	1.EARTH WORKS TOTAL COST					
					823,098,045,072.00	
	2.BRIDGE WORKS					
	2.1.Supersstructure worker					
	2.1.1.Steel girder (60m Truss)	t	1,040.00	110,000,000.00	114,400,000,000.00	※ 1
	2.1.2.Steel girder (40m Truss)	t	360.00	99,000,000.00	35,640,000,000.00	※ 1
	2.2.Substructure worker					
	2.2.1.Pier・Abutment	m ³	3,714.00	1,943,115.00	7,216,729,110.00	
	2.2.2.Basic construction tesi digging	m ³	1,860.00	690,695.00	1,284,692,700.00	
	2.2.2.Steel pipe yaita idutsu base	m	2,640.00	5,500,000.00	14,520,000,000.00	※ 2
	2.BRIDGE WORKS TOTAL COST					
					173,061,421,810.00	
	3.DRAIN WORKER					
	3.1.U type side ditch (direction of railway track)	m	68,880.00	591,512.00	40,743,346,560.00	
	3.2.Catchmento	no	1,376.00	4,125,000.00	5,676,000,000.00	
	3.3.Crossing drain	m	8,728.00	2,914,782.00	25,440,217,296.00	with the Hume pipe
	3.DRAIN WORKER TOTAL COST					
					71,859,563,856.00	
	Simpang~Mariana new line section EARTHWORK TOTAL COST					
					1,068,019,030,738.00	Rp

{ 97.1 hundred million yen}

※1; Japanese unit prise×110Rp

※2; Japanese unit prise×110Rp×50%

2.7. © idea: The coal unloading equipment is constructed in Gasing away from Simpang at about 45km.

2.7.1. Construction cost summary table

Work item	Foreign currency(Rp)	On inside(Rp)	Total price(Rp)
Existing sub ballast improvement Construction cost	0	0	0
Sub ballast Construction cost	0	58,041,456,000	58,041,456,000
Levelling the land Construction cost	0	6,418,888,804	6,418,888,804
Fill worker Construction cost	0	96,683,548,160	96,683,548,160
Cut worker Construction cost	0	0	0
Vegetation worker Construction cost	0	15,486,834,000	15,486,834,000
EARTH WORK TOTAL COST	0	118,589,270,964	118,589,270,964
Drain worker Construction cost	0	68,193,615,878	68,193,615,878
Ground improvement Construction cost(Pile net worker)	0	610,953,530,088	610,953,530,088
Superstructure worker Construction cost	142,890,000,000	0	142,890,000,000
Substructure worker Construction cost	0	26,799,376,200	26,799,376,200
BRIDGE TOTAL COST	142,890,000,000	1,001,166,520,094	1,144,056,520,094
Girder viaduct Superstructure worker Construction cost	1,072,500,000,000	0	1,072,500,000,000
Girder viaduct Substructure worker Construction cost	0	242,964,789,000	242,964,789,000
GIRDER VIADUCT TOTAL COST	1,072,500,000,000	242,964,789,000	1,315,464,789,000
Railroad crossing Construction cost	0	0	0
CONSTRUCTION TOTAL COST	1,215,390,000,000	1,125,542,038,130	2,340,932,038,130

2.7.2. Construction expense breakdown table

⑥ idea: The coal unloading equipment is constructed in Gasing away from Simpang at about 45km.

1/2

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	1.EARTH WORKS (Simpang~Gaing)					
	1.1.New sub ballast	m ³	95,072.00	610,500.00	58,041,456,000.00	Reinforced roadbed
	1.2.Levelling the land	m ²	417,842.00	15,362.00	6,418,888,804.00	
	1.3.Fill worker	m ³	545,372.00	177,280.00	96,683,548,160.00	Purchase soil use
	1.4.Pile net worker (Btween Pyk~Kpt)	m ²	417,842.00	1,462,164.00	610,953,530,088.00	Soft ground measures
	1.5.Vegetation worker	m ²	234,649.00	66,000.00	15,486,834,000.00	
	1.EARTH WORKS TOTAL COST				787,584,257,052.00	
	2.BRIDGE WORKS					
	2.1.Superstructure worker					
	2.1.1.Steel girder (60m Truss)	t	975.00	110,000,000.00	107,250,000,000.00	※ 1
	2.1.2.Steel girder (40m Truss)	t	360.00	99,000,000.00	35,640,000,000.00	※ 1
	2.2.Substructure worker					
	2.2.1.Pier・Abutment	m ³	4,296.00	1,943,115.00	8,347,622,040.00	
	2.2.2.Basic construction tesi digging	m ³	1,488.00	690,695.00	1,027,754,160.00	
	2.2.2.Steel pipe yaita idutsu base	m	3,168.00	5,500,000.00	17,424,000,000.00	※ 2
	2.BRIDGE WORKS TOTAL COST				169,689,376,200.00	

※1; Japanese unit prise×110Rp

※2; Japanese unit prise×110Rp×50%

No	Work item	Unit	Quantity	Unit price(Rp)	Total price(Rp)	Recapitulation
	3.GIRDER VIADUCT WORKS					
	3.1.Superstructure worker					
	3.1.1.Steel girder (Composite beam,I beam)	t	15,000.00	71,500,000.00	1,072,500,000,000.00	※ 1
	3.2.Substructure worker					
	3.2.1.Pier・Abutment	m ³	35,400.00	1,943,115.00	68,786,271,000.00	
	3.2.2.Basic construction tesi digging	m ³	32,400.00	690,695.00	22,378,518,000.00	
	3.2.3.Steel pipe yaita idutsu base	m	27,600.00	5,500,000.00	151,800,000,000.00	※ 2
	3.GIRDER VIADUCT WORKS TOTAL COST				1,315,464,789,000.00	
	4.DRAIN WORKER					
	4.1.U type side ditch (direction of railway track)	m	65,080.00	591,512.00	38,495,600,960.00	
	4.2.Catchment	no	1,300.00	4,125,000.00	5,362,500,000.00	
	4.3.Crossing drain	m	8,349.00	2,914,782.00	24,335,514,918.00	with the Hume pipe
	4.DRAIN WORKER TOTAL COST				68,193,615,878.00	
	Simpang~Gasing new line section EARTHWORK TOTAL COST				2,340,932,038,130.00	Rp

[212.8 hundred million yen]

※1; Japanese unit prise×110Rp

※2; Japanese unit prise×110Rp×50%

PENDAHULUAN

DAFTAR JEMBATAN P.JKA. MELIPUTI :

1	DATA-DATA JEMBATAN DAN KETENTUAN-KETENTUAN LAIN YANG BERTALIAN DENGAN PEMASANGAN / PEMELIHARAAN JEMBATAN.				
2	DISUSUN MENURUT SERI HURUF, SERI NOMER DAN BENTANG JEMBATAN. SERI HURUF DAN NOMOR, MENUNJUKAN TAHUN PERENCANAAN PEMBUATANNYA ATAU YANG DISEBUT TAHUN RENCANA MUATAN				
SERI B. S	№ (1 S/D 99)	RENCANA MUATAN TAHUN	1907	SUCUNDAIR	
SERI B.	№ (1 S/D 49) + B.№ 59.61	RENCANA MUATAN TAHUN	1907	PRIMAR (KECUALI B.№ 40)	
SERI B.	№ (1b S/D 59B)	RENCANA MUATAN TAHUN	1911	KECUALI B.№ 59 DAN 61	
SERI B.	№ (50 S/D 199)	RENCANA MUATAN TAHUN	1917		
SERI B.	№ (200 S/D 299)	RENCANA MUATAN TAHUN	1921		
SERI B.	№ (300 S/D 399)	RENCANA MUATAN TAHUN	1921		
SERI B.	№ (400 S/D 499)	RENCANA MUATAN TAHUN	1921		
SERI B.	№ (500 S/D 599)	RENCANA MUATAN TAHUN	1919	TRAM	
SERI B.	№ (600 S/D 699)	RENCANA MUATAN TAHUN	1921		
SERI B.	№ (700 S/D 799) 75%	RENCANA MUATAN TAHUN			
SERI B.	№ (1000 S/D 1099)	RENCANA MUATAN SEPOOR SEMPIT			
SERI B.	№ (2000 S/D 2099)	RENCANA MUATAN SEPOOR SEMPIT			
SERI D.	№ (1 S/D 34)	RENCANA MUATAN TAHUN	1907	PRIMAR	
SERI D.	№ (35 S/D 99)	RENCANA MUATAN TAHUN	1907	SUCUNDAIR	
SERI D.	DAPAT DILIHAT PERSAMAANNYA PADA RM.1907 SUCUNDAIR DAN 1907 PRIMAIR				

MENGETAHUI / SETUJU,
 BANDUNG 1977
 DKKR

DISUSUN,
 BANDUNG, 28 - 6 - 1977
 PATN

(IR. AJEH KARJANA) (SOEDARMO)

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Konsol Ujung Sampai Tumpu	Ujung Rasuk Pokok Sampai Tumpu	Jarak Kesisi Antara 2 Jembatan	Berat (kg)		Luas Cat (m ²)
							Konstruksi	Andas Baja	Andas Beton	Panjang	Lebar				Tanpa Andas Baja	Dengan Andas Baja	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Daftar Jembatan Baja Seri B.Ne 300 Kuat untuk Rencana Muatan 1921 (Lengkap 3 Helai)																	
Helai 1																	
Jembatan RS. SP Tengg	300		1.50	2.000	2.400	1.120	0.370	0.450	0.720	0.550	2.250				657	987	13
Jembatan RS. SP Tengg	300a		1.50	2.000	2.400	1.120	0.364	0.444	0.714	0.550	2.250				657	987	12
Jembatan Rasuk	301		2.00	2.600	3.000	1.150	0.685	0.765	1.035	0.550	2.250				601	798	11
Jembatan Rasuk	301/AM		2.00	2.600	3.000	1.150	0.676	0.756	0.000						676	883	11
Jembatan RS. SP Tengg	302		2.00	2.600	3.000	1.120	0.372	0.452	0.722	0.550	2.250				965	1325	17
Jembatan RS. SP Tengg	302a		2.00	2.600	3.000	1.120	0.366	0.446	0.716	0.550	2.250				965	1325	17
Jembatan RS. SP Tengg	302b		2.00	2.600	3.000	1.120	0.366	0.446	0.716	0.550	2.250				965	1325	17
Jembatan RS. SP Tengg	302c		2.00	2.600	3.000	1.120	0.392	0.366	0.716	0.800	0.600				1073	1404	17
Jembatan Rasuk	303		3.00	3.600	4.000	1.150	0.775	0.855	1.125	0.200	2.250				1191	1396	17
Jembatan RS. SP Tengg	304		3.00	3.600	4.000	1.120	0.380	0.460	0.730	0.550	2.250				1784	2144	26
Jembatan RS. SP Tengg	304a		3.00	3.600	4.000	1.120	0.374	0.454	0.724	0.550	2.250				1784	2144	26
Jembatan RS. SP Tengg	304b		3.00	3.600	4.000	1.120	0.251	0.331	0.631	0.800	0.600				1782	2142	26
Jembatan Rasuk	305		4.00	4.600	5.000	1.150	0.825	0.925	1.275	0.550	2.440				1764	2029	24
Jembatan Rasuk	306		4.00	4.600	5.000	1.150	0.725	0.805	1.125	0.550	2.440				1950	2247	25
Jembatan RS. SP Tengg	306a		4.00	4.600	5.000	1.150	0.725	0.805	1.125	0.720	0.600				1852	2138	24
Jembatan Rasuk	306b		4.00	4.600	5.000	1.148	0.739(5)	0.819(5)	1.139(5)	0.720	0.600				1640	1932	24
Jembatan Rasuk	306c		4.00	4.600	5.000	1.180	0.690	0.771	-	-	-				1950	2201	25
Jembatan RS. SP Tengg	307		4.00	4.600	5.000	1.120	0.390	0.470	0.790	0.550	2.440				2607	2987	36
Jembatan RS. SP Tengg	307a		4.00	4.600	5.000	1.120	0.384	0.464	0.784	0.560	2.440				2080	2987	36
Jembatan RS. SP Tengg	307b		4.00	4.600	5.000	1.120	0.380	0.455	0.775	0.960	0.600				2142(2)	2269(2)	36
Jembatan RS. Kembar	307c		4.00	4.600	5.000	1.120	0.719	0.799	1.119	0.960	0.600				2550(2)	2930(2)	36
Jembatan Rasuk	308		5.00	5.600	6.000	1.180	0.825	0.905	1.275	0.550	2.440				2909	3006	30
Jembatan Rasuk	308a		5.00	5.600	6.000	1.180	0.825	0.905	1.275	0.700	0.600				2629	2945	30
Jembatan RS. SP Tengg	309		5.00	5.600	6.000	1.150	0.440	0.520	0.840	0.550	2.440				3576	3956	45
Jembatan RS. SP Tengg	309a		5.00	5.600	6.000	1.150	0.434	0.514	0.834	0.550	2.440				3576	3956	45
Jembatan Rasuk	309b		5.00	5.600	-	-	-	-	-	-	-				3576	3648	45
Jembatan RS. Kembar	309/1		5.00	5.600	6.000	1.150	0.769	0.833	-	-	-				3287	3624	39
Jembatan Rasuk	310		6.00	6.720	7.300	1.200	1.069	1.174	1.504	0.650	2.700				3835	4343	50
Jembatan RS. Plat	310/AM		6.00	6.720	-	1.200	1.076	1.177	-	-	-				3853	4357	50
Jembatan RS. SP Tengg	311		6.00	6.720	7.320	1.157	0.451	0.531	0.901	0.650	2.980				5992	6589	72
Jembatan DD Plat	312		6.00	6.720	7.448	2.000	0.765	0.837	1.167	0.720	0.820				5727	6234	68
Jembatan Rasuk	313		8.00	8.720	9.300	1.200	1.324	1.426	1.756	0.720	2.700				5796	6482	69
Jembatan RS. SP Tengg	314		8.00	8.840	9.340	1.157	0.493	0.573	0.943	0.650	2.980				9193	9790	98

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Konsol Ujung Sampai Tumpu	Ujung Rasuk Pokok Sampai Tumpu	Jarak Kesisi Antara 2 Jembatan	Berat (kg)		Luas Cat (m ²)
							Konstruksi	Andas Baja	Tepi Bawah Andas Beton	Panjang	Lebar				Tanpa Andas Baja	Dengan Andas Baja	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Helai 2																	
Jembatan RS, SP Teng	314a		8,00	8,400	9,340	1,157	0,493	0,573	0,943	2,760	0,840				9019	7616	98
Jembatan DD Plat	315		8,00	8,720	9,454	3,000	0,800	0,877	1,207	0,720	0,920				9154	10040	120
Jembatan Rasuk	317		8,00	9,150	10,280	1,200	1,384	1,476	1,806	1,128	2,700				6020	6642	71
Jembatan DD Plat	318		10,00	10,720	12,500	1,250	1,468	1,579	1,909	0,720	2,700				8084	8733	99
Jembatan DD Plat	319		10,00	10,720	11,454	3,000	0,820	0,909	1,239	-	1,040				12456	13145	155
Jembatan Rasuk	320		12,00	12,960	13,560	1,250	1,686	1,814	2,384	0,960	2,700				12124	13100	140
Jembatan DD Plat	321		12,00	12,960	13,700	3,080	0,868	0,984	1,554	0,920	0,920				17433	18324	200
Jembatan Rasuk	322		12,50	13,440	13,980	1,250	1,688	1,814	2,384	0,650	2,700				12522	13416	145
Jembatan DD Plat	323		12,50	13,440	13,900	3,080	0,868	0,984	1,554	-	-				18413	19293	-
Jembatan DD Plat LLB	323		12,50	13,440	14,000	3,080	0,868	0,984	1,554	0,840	0,940				18402	19293	195
Jembatan Rasuk	324		15,00	15,960	16,620	1,400	1,908	2,034	2,604	0,850	2,700				16911	17975	190
Jembatan DD Plat	325		15,00	15,960	16,700	4,100	0,872	0,998	1,568	0,960	0,960				26845	27885	290
Jembatan Rasuk	326		20,00	21,200	21,810	1,500	3,255	3,869	4,429	0,900	2,700				26263	29470	285
Jembatan DD RK Terbuka	327		20,00	21,200	22,100	4,400	0,985	1,426	1,936	1,100	1,100				39147	42207	505
Jembatan DD Rangka	328		24,80														
Jembatan DD RK Terbuka	329		25,00	26,160	26,930	4,400	1,091	1,640	2,280	0,535	-				48543	52958	-
Jembatan DD RK LLB	329		25,00	26,160	26,930	4,400	1,091	1,640	2,280	1,160	1,440				48543	52958	589
Jembatan DD RK Terbuka	330		25,00	26,160	27,230	4,400	1,022	1,562	2,132	1,100	1,400				49920	54359	670
Jembatan DD Rangka	331		30,00	31,250	32,460	3,600	4,503	2,315	3,045	1,200	1,500				62406	65712	895
Jembatan DD RK Terbuka	332		30,00	31,250	32,470	4,600	1,241	1,695	2,425	1,200	1,500				65296	68564	850
Jembatan DD Rangka	334		40,00	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD RK Terbuka	335		40,00	41,400	42,720	4,600	1,245	1,759	2,629	-	1,600				104066	108620	1270
Jembatan DD Rangka	336		50,00	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD Rangka	337		50,00	51,480	52,980	4,600	1,364	1,969	2,839	1,480	1,920				148371	155186	1720
Jembatan DD Rangka	337a		50,00	51,480	52,980	4,600	1,375	1,980	2,850	-	1,800				148638	155492	1720
Jembatan DD RK Lengk LLB	338		50,00	51,480	53,130	4,600	1,326	1,935	2,805	-	1,800				135500	142160	1650
Jembatan DD Rangka	339b		56,34	57,980	59,620	4,600	1,334	2,035	2,965	-	1,800				171730	180125	2150
Jembatan DD RK Lengk LLB	339c		55,44	57,080	58,720	4,600	1,334	2,035	2,965	-	1,800				170810	179204	2140
Jembatan DD Rangka	340		60,00	61,620	-	-	-	-	-	-	-				-	-	-
Jembatan DD RK Lengk LLB	341		70,00	71,700	63,260	4,600	1,439	2,165	3,115	-	1,960				203207	213172	2230
Jembatan DD RK Lengk LLB	342b		70,00	71,700	73,340	4,800	1,472	2,320	3,440	-	2,200				270230	282272	3100
Jembatan Rasuk	350a		2,00	2,550	2,910	1,150	0,719	0,814	0,994	2,250	0,550				871	1068	14
Jembatan Rasuk	350		2,60	3,080	3,420	1,150	0,725	0,805	1,075	0,550	2,250				866	1063	12
Jembatan Rasuk	351		3,10	3,510	3,900	1,150	0,775	0,855	1,175	0,550	2,440				1183	1372	16

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Konsol Ujung Sampai Tumpu	Ujung Rasuk Pokok Sampai Tumpu	Jarak Kesisi Antara 2 Jembatan	Berat (kg)		Luas Cat (m ²)
							Konstruksi	Andas Baja	Tepi Bawah Andas Beton	Panjang	Lebar				Tanpa Andas Baja	Dengan Andas Baja	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Helai 3																	
Jembatan Rasuk	351/AM		3.10	3.510	0.390	1.151	0.836	0.917	-	-	-				1060	1249	20
Jembatan Rasuk	352		4.30	4.820	5.220	1.180	0.750	0.830	1.150	2.440	0.550				1950	2247	25
Jembatan Rasuk	352/AM		4.30	4.820	5.220	1.180	0.780(3)	0.860(3)	1.080	2.440	0.520				1713	2010	25
Jembatan DD Plat	353		5.30	14.250	20.440	4.52	0.988	1.102	1.672	-	-				23548	24894	270
Jembatan Rasuk	354		3.50	4.100	4.500	1.150	0.800	0.900	1.220	0.550	2.440				1469	1734	19
Jembatan RS. SP Tengg	355		4.30	4.820	5.220	1.130	0.409	0.489	0.809	0.550	2.440				2250	3309	41
Jembatan Rasuk	356		3.50	4.000	4.400	1.150	0.685	0.765	1.035	0.550	2.440				1445	1715	20
Jembatan RS. SP Tengg	357		10.00	10.720	11.220	1.157	0.643	0.723	1.030	0.650	2.980				13925	14517	140
Jembatan RS. SP Tengg	358		5.00	5.600	6.000	1.157	0.440	0.520	0.790	-	-				5375	5970	58
Jembatan DD Plat	360		15.662	17.872	18.612	3.360	1.534	1.989	2.419	-	-				32664	34951	385
Jembatan Rasuk	361		15.140	16.440	17.000	1.400	1.911	2.028	2.358	0.950	0.950				21771	23007	-
Jembatan DD RK Terbuka	362		35.00	36.300	37.600	4.600	1.255	1.749	2.519	-	0.400				78428	82486	1000
Jembatan Rasuk	363		16.34	18.180	18.680	1.500	2.237	2.650	3.060	-	-				25179	27206	315
Jembatan DD Plat LLB	364		15.322	17.096	-	-	-	-	-	-	-				-	-	-
Jembatan DD Plat LLB	364		15.322	17.096	17.616	3.248	5.071	4.955	-	-	-				29313	30877	324
Jembatan RS. Serong	365		13.000	19.390	19.890	1.750	2.112	2.570	3.140	-	0.260				39336	43217	375
Jembatan DD Plat	366		15.14	16.440	17.180	3.050	1.308	1.424	1.754	-	-				26543	-	270
Jembatan RS. SP Tengg	367		8.00	8.400	9.340	1.157	0.523	0.551	0.921	2.760	0.650				11658	12165	95
Jembatan DD RK Lengk LLB	368		38.50	40.320	40.720	2.800	1.291	6.700	-	-	-				110770	124055	1020
Jembatan DD RK Lengk LLB	369		82.83	84.830	86.470	4.800	1.508	2.455	3.325	-	-				336700	352650	3710
Jembatan Rasuk	370		20.00	21.200	21.660	1.500	2.660	2.083	2.613	-	-				25468	28675	280
Jembatan DD RK Terbuka	372		35.74	37.100	38.420	4.600	1.255	1.749	2.519	1.500	1.500				79880	84270	1060
Jembatan RS. SP Tengg	374		2.50	3.100	3.500	1.120	0.37	0.450	0.720	0.550	2.250				1331	1692	20
Jembatan RS. SP Tengg	375		6.668	7.378	7.880	1.157	0.232	0.312	0.682	-	-				7100	7692	83
Jembatan DD Rangka	376		60.00	61.680	63.180	4.600	1.601	2.303	3.252	-	-				185172	195171	2235
Jembatan DD Rangka	376a		BELUM DAPAT DISYAHKAN (RENCANA UNTUK K. SERAYU KEBASEN)														
Jembatan Rasuk	377		9.00	9.720	10.440	1.300	1.376	1.475	1.805	0.650	2.700				6897	7583	94
Jembatan RS. SP Tengg	378		9.00	9.750	10.350	1.157	0.613	0.693	1.063	0.650	2.980				12177	12769	120
Jembatan RS. Plat	379/AM		16.00	17.000	17.800	1.400	1.896	1.955	-	-	-				18949	19499	195
Jembatan DD Rangka	380		2x36	GAMBAR BELUM DAPAT DISYAHKAN (RENCANA UNTUK K. SERAYU KEBASEN)													

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Konsol Ujung Sampai Tumpu	Ujung Rasuk Pokok Sampai Tumpu	Jarak Kesisi Antara 2 Jembatan	Berat (kg)		Luas Cat (m ²)
							Konstruksi	Andas Baja	Tepi Bawah Andas Beton	Panjang	Lebar				Tanpa Andas Baja	Dengan Andas Baja	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Daftar Jembatan Baja Seri B.Ne 400 Kuat untuk Rencana Muatan 1921 (Lengkap 5 Helai)																	
Helai 1																	
Jembatan RS. SP Tengg	401a/AM		2.00	2.400	2.700	-	-	-	-	-	-	-	-	-	1091	1263	19
Jembatan RS. SP Tengg	401		2.00	2.600	3.000	1.120	0.372	0.432	0.612	0.550	2.250	-	-	-	1056	1305	17
Jembatan RS. SP Tengg	401a		2.00	2.600	3.000	1.120	0.366	0.426	0.606	0.550	2.250	-	-	-	1047	1296	17
Jembatan RS. SP Tengg	401b		2.00	2.600	3.000	1.120	0.342	0.402	0.582	0.550	2.250	-	-	-	1047	1296	17
Jembatan RS. Profil	401c		2.00	2.600	3.000	1.150	0.628	0.744	-	-	-	-	-	-	857	1088	14
Jembatan RS. Kembang	401b/I		2.00	2.600	3.000	1.120	0.600	0.670	-	-	-	-	-	-	982	1231	17
Jembatan RS. Profil	R.401c		2.00	2.600	3.000	1.150	0.628	0.744	-	-	-	-	-	-	767	993	13
Jembatan RS. Profil	R.401d		2.00	2.600	3.000	1.150	0.720	-	-	-	-	-	-	-	713	-	3
Jembatan RS. Profil	402		3.00	3.600	4.000	1.150	0.719	0.795	-	-	-	-	-	-	1541	1833	21
Jembatan RS. Profil	402a		3.00	3.600	4.000	1.150	0.791	0.907	-	-	-	-	-	-	1242	1493	18
Jembatan RS. Profil	A402a		3.00	3.600	4.000	1.150	0.791	0.907	-	-	-	-	-	-	1408	1646	20
Jembatan RS. Profil	403		4.00	4.600	5.000	1.150	0.719	0.799	-	-	-	-	-	-	1892	2157	26
Jembatan RS. Profil	403a		4.00	4.600	5.000	1.150	0.930	1.046	1.316	-	-	-	-	-	1734	1973	22
Jembatan RS. Serong	403/s		2.00	2.978	4.510	1.150	0.719	0.799	-	0.900	0.900	-	-	-	1719	1984	22
Jembatan RS. Serong	403/L/s		4.00	5.115	5.515	1.150	0.719	0.795	-	-	-	-	-	-	1541	1833	28
Jembatan RS. Profil	404		5.00	5.600	6.000	1.200	1.064	1.134	-	-	-	-	-	-	2400	2653	-
Jembatan RS. Profil	404AM		5.00	5.600	6.000	1.200	0.930	1.000	-	-	-	-	-	-	2400	2653	35
Jembatan RS. Profil	404a/AM		5.00	5.600	6.000	1.150	0.861	0.961	1.181	0.600	2.440	-	-	-	2807	3080	36
Jembatan RS. Profil	A404/AM		5.00	5.600	6.000	1.200	0.930	1.000	-	-	-	-	-	-	2623	2876	40
Jembatan RS. Profil	405		6.00	6.720	7.200	1.200	0.997	1.056	-	-	-	-	-	-	3938	4254	46
Jembatan RS. Profil	A.405		6.00	6.720	7.200	1.200	0.997	1.056	-	-	-	-	-	-	4091	4407	51
Jembatan RS. Profil	406		4.30	4.800	5.200	1.200	0.930	1.040	-	-	-	-	-	-	2134	2366	35
Jembatan RS. Profil	A406		4.30	4.820	5.220	1.180	0.719	0.799	-	-	-	-	-	-	1941	2238	26
Jembatan RS. Profil	A406a		4.30	4.820	5.200	1.200	0.930	1.065	-	-	-	-	-	-	2152	2500	35
Jembatan RS. Plat	407		8.00	8.720	9.300	1.200	1.310	1.374	1.654	0.650	2.700	-	-	-	4982	5266	74
Jembatan RS. Profil	407A		8.00	8.720	9.300	1.200	1.347	1.451	-	-	-	-	-	-	6884	7390	78
Jembatan RS. Plat	407AM		8.00	8.720	9.300	-	-	-	-	-	-	-	-	-	5186	5466	71
Jembatan RS. Plat	408		10.00	10.720	11.320	1.250	1.470	1.624	-	-	-	-	-	-	7047	7403	97
Jembatan RS. Profil	408A		10.00	10.720	11.320	1.250	1.347	1.406	-	-	-	-	-	-	8334	8690	95
Jembatan RS. Plat	408B		10.00	10.720	11.320	1.250	1.470	1.524	-	-	-	-	-	-	7232	7588	100
Jembatan RS. Plat	408AM		10.00	10.720	11.320	1.250	1.441	1.494	-	-	-	-	-	-	7237	7593	97
Jembatan RS. Plat	408A/AM		10.00	10.720	11.320	1.250	1.441	1.494	-	-	-	-	-	-	7451	7807	101
Jembatan RS. Rangka	409		12.00	12.960	13.760	1.300	2.407	1.220	-	-	-	-	-	-	8603	9160	135
Jembatan RS. Profil	R403a		4.00	4.600	5.000	1.150	0.930	1.046	-	-	-	-	-	-	1837	2076	24

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Berat (kg)		Luas Cat (m ²)			
							Konstruksi	Andas Baja	Tepi Bawah Andas Beton	Panjang	Lebar	Tanpa Andas Baja	Dengan Andas Baja				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Helai 2																	
Jembatan RS. Plat	410		15.00	15.960	16.770	1.400	1.931	2.259	2.389	0.850	2.700				16065	17129	171
Jembatan RS. Plat	410A		15.00	15.960	16.770	1.400	1.931	2.059	2.389	0.850	2.700				16353	17425	191
Jembatan RS. Plat	410A/M		15.00	15.960	16.770	1.400	1.908	2.035	-	-	-				16795	17859	171
Jembatan RS. Plat	410A/AM		15.00	15.960	16.770	1.400	1.908	2.035	2.565	0.960	0.960				17072	18144	18
Jembatan RS. Plat	411		20.00	21.200	22.200	1.500	3.557(5)	1.685	2.265	1.100	0.500				20138	22012	26
Jembatan RS. Rangka	412		20.00	21.200	22.200	1.500	3.557(5)	1.685	2.085	1.100	2.700				21806	23843	27
Jembatan DD. Plat	413		8.00	8.720	9.340	3.000	0.785	0.902	-	-	-				8147	8827	-
Jembatan DD. Plat	413a		8.00	8.720	9.350	3.000	0.707	0.834	1.324	0.720	0.920				8945	9229	130
Jembatan DD. Plat	413c		8.00	12.960	13.920	3.080	0.863	0.909	1.399	0.920	0.920				-	-	-
Jembatan DD. Plat	413a/AM		8.00	8.720	9.350	3.000	0.799	0.864(5)	-	-	-				8821	9105	131
Jembatan DD. Plat	414		10.00	10.720	11.220	3.200	0.833	0.960	-	-	-				9313	9993	-
Jembatan DD. Plat	414a		10.00	10.720	11.140	3.000	0.800	0.854	1.404	1.040	0.720				11629	11985	170
Jembatan DD. Plat	414b		10.00	10.720	11.220	3.200	0.833	0.960	-	-	-				-	-	-
Jembatan DD. Plat	414c		10.00	10.720	11.140	3.000	0.805	0.859	1.409	0.720	1.040				13585	13941	170
Jembatan DD. Plat	414a/AM		10.00	10.720	11.140	3.000	0.812	0.865	-	-	-				12034	12390	170
Jembatan DD. Plat	415		12.00	12.960	13.920	3.080	0.863	0.909	1.399	0.920	0.920				16745	17410	195
Jembatan DD. Plat	415A/M		12.00	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD. Plat	415a/AM		12.00	12.960	13.520	3.080	0.888	0.953	-	-	-				17131	17796	190
Jembatan DD RK Terbuka	416a		15.00	15.960	16.990	4.600	0.931	1.100	1.630	0.960	0.960				21497	22697	325
Jembatan RS. Rangka	416b		15.00	15.960	16.990	4.600	1.269	1.713	2.053	0.960	1.500				75970	78829	1030
Jembatan RS. Plat	417		20.00	21.200	21.680	1.500	2.350	-	-	-	-				24885	-	296
Jembatan RS. Rangka	418		15.00	16.000	17.000	1.300	2.850	1.310	1.740	0.850	2.700				12157	13110	236
Jembatan RS. Rangka	418A		15.00	15.700	16.500	1.300	2.850	1.260	1.690	0.850	2.700				11971	12521	235
Jembatan RS. Kembar	419		4x16.00	17.000	16.700	1.155	1.344	-	-	-	-				-	-	-
Jembatan DD RK SP diatas	419		-	16.000	16.700	1.155	1.312	-	-	-	-				24616	-	243
Jembatan RS PL kembar	419A		-	16.000	16.700	1.155	1.460	1.408(4)	-	-	-				23838	-	255
Jembatan DD RK Terbuka	420		25.00	26.100	27.110	4.600	0.943	1.340	2.070	1.100	1.400				47801	50306	700
Jembatan DD RK Terbuka	421		30.00	31.320	32.520	4.600	0.943	1.430	2.210	1.200	1.500				61183	64485	900
Jembatan DD PL Serong	422		25.00	26.410	27.510	4.600	0.763	1.305	2.035	1.100	1.400				55457	58623	660
Jembatan DD Rangka	423		-	31.200	32.200	2.900	5.048	3.855	4.585	1.200	1.500				58253	61001	830
Jembatan DD RK Terbuka	424c		20.00	21.180	22.410	4.600	1.175	1.604	2.184	1.100	1.100				32.125	35.010	490
Jembatan DD RK Terbuka	424e		20.00	21.180	22.410	4.600	0.768	1.194	1.774	1.100	1.100				36.427	39.280	475
Jembatan DD. Plat	424e/AM		20.00	21.180	22.410	4.600	0.788	1.202	-	-	-				37.435	40.288	550

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Konsol Ujung Sampai Tumpu	Ujung Rasuk Pokok Sampai Tumpu	Jarak Kesisi Antara 2 Jembatan	Berat (kg)		Luas Cat (m ²)
							Konstruksi	Andas Baja	Tepi Bawah Andas Beton	Panjang	Lebar				Tanpa Andas Baja	Dengan Andas Baja	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Helai 3																	
Jembatan DD RK Terbuka	425		25.00	26.100	27.500	4.600	1.206	1.763	2.493	1.100	1.400				42600	46934	610
Jembatan DD RK Terbuka	425A		25.00	26.100	27.500	4.600	1.483	1.872	2.602	1.100	1.400				45065	47608	610
Jembatan DD RK Terbuka	426		30.00	31.200	32.590	4.600	1.273	1.745	0.525	1.200	1.500				56262	59585	895
Jembatan DD Rangka	427A		35.74	37.120	38.630	4.600	1.269	1.783	2.563	1.360	1.560				74745	79135	1030
Jembatan DD Rangka	427B		35.74	37.120	38.630	4.600	0.865	1.379	2.159	1.360	1.560				79300	83890	1045
Jembatan DD Rangka	427C		35.74	37.120	38.630	4.600	1.269	1.713	2.053	1.360	1.500				75970	78829	1030
Jembatan DD Rangka	427D		35.74	37.120	38.630	4.600	1.284	1.798	2.578	1.360	1.500				79582	84114	1070
Jembatan DD Rangka	427E		35.74	37.120	38.630	4.600	1.284	1.798	2.578	1.360	1.500				80203	84725	1070
Jembatan DD Rangka	427A/JIS		35.74	37.120	38.630	4.600	1.271	1.784	-	-	-				77928	82388	1060
Jembatan DD Rangka	428		40.00	41.600	43.110	4.600	1.522	2.034	2.864	1.400	1.600				94835	98629	1300
Jembatan Rasuk	428C		2.508	2.908	3.198	1.300	0.745	0.815	-	-	-				936	1050	15
Jembatan DD Rangka	428A/M		40.00	41.600	43.110	4.600	1.498	1.962	-	-	-				88109	91888	1430
Jembatan DD LL dibawah	428A/AM		40.00	41.600	42.990	4.600	1.498	2.072	-	-	-				89848	94671	1430
Jembatan DD LL dibawah	428B/AM		40.00	41.600	42.990	4.600	1.499	2.013	-	-	-				90253	94602	1430
Jembatan DD LL dibawah	428A/IS		40.00	41.600	43.110	4.600	1.539	1.536	2.316	-	-				94160	97954	1360
Jembatan DD Rangka	428/JIS		40.00	41.600	43.110	4.600	1.537	2.049	2.879	1.400	1.600				92879	96673	1472
Jembatan DD Rangka	429		45.00	46.800	48.300	4.600	1.252	1.794	-	-	-				118328	122122	1340
Jembatan DD Rangka	429A		45.00	46.800	48.300	4.600	1.267	1.769	-	-	-				120943	124437	1370
Jembatan DD Rangka	429B		45.00	46.800	47.800	4.600	1.252	1.764	2.694	1.150	1.700				115502	119296	1340
Jembatan DD Rangka	429/JIS		45.00	46.800	48.300	4.600	1.307	1.819	-	-	-				119630	123614	1355
Jembatan DD Rangka	429B/JIS		45.00	46.800	47.800	4.600	1.307	1.819	-	-	-				119532	123326	1374
Jembatan DD Rangka	430A/M		18.00	19.340	20.440	4.600	1.1295	1.4706	-	-	-				36800	-	435
Jembatan DD Rangka	431		15.00	15.654	16.094	3.300	1.774	1.812	2.062	0.960	0.960				2725	-	371
Jembatan DD Rangka	432		15.00	16.000	17.000	1.300	2.850	1.260	1.660	0.520	2.700				12315	12.865	242
Jembatan DD Rangka	432d		15.00	16.000	17.000	1.300	2.850	1.260	2.268	0.850	2.700				12315	12865	241
Jembatan DD Rangka	433		15.00	16.000	17.000	1.300	2.885	1.380	1.780	0.820	2.700				13749	14.209	250
Jembatan DD Rangka	433a		15.00	16.000	17.000	1.300	2.885	1.830	1.780	0.820	2.700				15332	15.882	360
Jembatan DD Rangka	A433		15.00	15.800	16.500	1.300	2.885	1.380	-	-	-				14357	14907	261
Jembatan DD Rangka	A433A/IS		15.00	15.800	16.810	1.300	2.964	1.896	-	-	-				17137	17699	221
Jembatan DD Rangka	A433A/IS/II		15.00	15.800	16.650	1.300	2.964	1.896	-	-	-				17013	17567	229
Jembatan DD Rangka	435		-	125.000	126.440	7.500	2.074	3.664	-	-	-				702221	724535	-
Jembatan DD Rangka	436		96.00	96.000	97.100	6.000	-	-	-	-	-				353633	-	-
Jembatan DD Rangka	437		-	-	37.500	38.770	4.179	-	-	-	-				-	-	-
Jembatan DD Rangka	437		-	13.000	13.560	1.300	4.034	-	-	-	-				10.271	-	14

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Konsol Ujung Sampai Tumpu	Ujung Rasuk Pokok Sampai Tumpu	Jarak Kesisi Antara 2 Jembatan	Berat (kg)		Luas Cat (m ²)
							Konstruksi	Andas Baja	Andas Beton	Panjang	Lebar				Tanpa Andas Baja	Dengan Andas Baja	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Helai 4																	
Jembatan DD Rangka	437f		20.00	20.700	21.500	6.0625	-	-	-	-	-	-	-	-	23836	26636	300
Jembatan DD Plat	438		15.00	15.960	16.440	2.960	0.8775	0.996	-	-	-	-	-	-	24506	26092	270
Jembatan DD Plat	438A		15.00	15.960	16.440	3.200	0.9534	1.074	1.604	0.960	-	-	-	-	28535	24631	301
Jembatan DD Plat	438A/AM		15.00	15.960	16.440	3.200	0.9534	1.074	1.604	0.960	-	-	-	-	25023	26119	309
Jembatan DD Plat	438B/AM		15.00	15.960	16.440	3.200	0.9534	1.044	1.574	0.960	-	-	-	-	25724	26999	309
Jembatan DD Rangka	439		50.00	51.480	53.000	4.600	1.500	2.097	3.027	1.480	1.800	-	-	-	129238	134048	1520
Jembatan DD Rangka	439A		50.00	51.010	52.110	4.600	1.500	2.097	3.027	1.480	1.800	-	-	-	129045	134155	1470
Jembatan DD Rangka	439/JIS		50.00	51.430	53.000	4.600	1.515	2.122	-	-	-	-	-	-	134919	145219	1543
Jembatan DD Rangka	439A/NIS		50.00	51.010	52.110	4.600	1.500	-	-	-	-	-	-	-	126262	132481	-
Jembatan DD Rangka	440		60.00	61.600	62.950	4.600	1.624	2.267	-	-	-	-	-	-	175243	181810	2012
Jembatan DD Rangka	441		28.00	28.800	29.800	2.960	5.767	-	-	-	-	-	-	-	48133	50657	701
Jembatan DD Rangka	442		54.00	56.600	57.800	5.000	9.7625	-	-	-	-	-	-	-	153823	-	1810
Jembatan RS. Plat	443		12.00	12.860	13.560	1.400	1.630	1.754	2.034	0.650	2.700	-	-	-	10938	11714	140
Jembatan RS. Plat	443A/M		12.00	12.960	13.560	1.400	1.654	1.781	-	-	-	-	-	-	11645	12621	146
Jembatan RS. Rangka	443d/AM		12.00	12.960	-	-	-	-	-	-	-	-	-	-	10928	-	143
Jembatan DD Rangka	444		60+90+60	SERAYU - KEBASEN	-	-	-	-	-	-	-	-	-	-	-	700000	-
Jembatan DD Rangka	445		60.00	61.600	62.950	4.600	1.620	2.247	3.277	1.620	1.960	-	-	-	179907	184736	2000
Jembatan DD Rangka	445/JIS		60.00	61.600	62.950	4.600	1.6325	2.249(5)	-	-	-	-	-	-	186351	191174	2127
Jembatan DD Rangka	446		30.00	31.200	32.590	4.600	1.268	1.740	2.520	1.200	1.500	-	-	-	35775	59117	885
Jembatan DD RK Terbuka	446a		30.00	31.200	32.600	4.600	1.255	1.750	-	-	-	-	-	-	61642	64984	880
Jembatan DD RK Terbuka	446b		30.00	31.200	32.590	4.600	1.245	1.740	-	-	-	-	-	-	60601	63943	880
Jembatan DD RK SP diatas	446c		30.00	31.200	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD Rangka	446A/M		30.00	31.200	32.600	4.600	1.303	1.727	-	-	-	-	-	-	57160	60587	950
Jembatan DD Rangka	446/JIS		30.00	31.200	32.590	4.600	1.258	1.730	-	-	-	-	-	-	56518	59860	835
Jembatan DD Rangka	446A/JIS		30.00	31.200	32.600	4.600	1.381	1.840	-	-	-	-	-	-	68012	71380	910
Jembatan DD Rangka	447		56.34	58.000	59.640	4.600	1.299	1.925	-	-	-	-	-	-	159946	168441	2000
Jembatan DD Rangka	448		70.00	72.000	73.500	4.800	1.653	2.320	-	-	-	-	-	-	249541	256312	2840
Jembatan DD RK LL diatas	449		-	38.425	39.225	3.300	6.942	4.948	5.778	-	-	-	-	-	-	-	226
Jembatan DD RK LL diatas	449a		-	37.850	38.650	3.300	6.942	4.948	5.778	-	-	-	-	-	-	-	-
Jembatan DD RK LL diatas	449b		-	38.200	35.000	3.300	6.942	4.948	5.778	-	-	-	-	-	-	-	-
Jembatan DD RK LL diatas	449c		-	38.775	39.580	3.300	6.942	4.948	5.778	-	-	-	-	-	-	-	875
Jembatan DD RK LL diatas	449d		-	38.775	-	-	PENGHUBUNG (BM)										-
Jembatan RS. SP Tengg	451		1.50	2.000	2.400	1.120	0.384	0.624	0.624	0.450	2.250	-	-	-	812	1056	14
Jembatan Rasuk	452/AM		2.00	2.400	2.700	1.200	0.634(5)	0.959(5)	0.959(5)	0.550	2.440	-	-	-	988	1158	14

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Konsol Ujung Sampai Tumpu	Ujung Rasuk Pokok Sampai Tumpu	Jarak Kesisi Antara 2 Jembatan	Berat (kg)		Luas Cat (m ²)
							Konstruksi	Tepi Bawah Andas Baja	Tepi Bawah Andas Beton	Panjang	Lebar				Tanpa Andas Baja	Dengan Andas Baja	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Helai 5																	
Jembatan RS. SP Tengg	454		3.00	3.600	4.000	1.120	0.374	0.434	0.614	0.550	2.250				1913	2157	27
Jembatan RS. SP Tengg	454A/AM		3.00	3.600	4.000	1.120	0.445	0.505	-	-	-				1754	1998	28
Jembatan RS. SP Tengg	454A/AM		3.00	3.600	4.000	1.120	0.464	0.544	-	-	-				2191	2435	30
Jembatan RS. SP Tengg	455		4.00	4.600	5.000	1.120	0.404	0.464	0.694	0.550	2.440				2600	2906	36
Jembatan RS. SP Tengg	456		4.30	4.820	5.220	1.130	0.429	0.489	0.719	0.500	2.440				3066	3372	40
Jembatan RS. SP Tengg	456A/AM		4.30	4.820	5.220	1.130	0.521	0.581	-	-	-				2921	3227	41
Jembatan RS. SP Tengg	457		5.00	5.600	6.000	1.150	0.454	0.514	0.744	0.550	2.440				3732	4038	47
Jembatan RS. SP Tengg	457a		5.00	5.600	6.000	1.150	0.454	0.514	0.744	0.550	2.440				3773	4058	47
Jembatan RS. SP Tengg	457AM		5.00	5.600	6.000	1.150	0.572	0.632	-	-	-				3059	3965	50
Jembatan RS. SP Tengg	457a/AM		5.00	5.600	6.000	1.150	0.572	0.632	-	-	-				3693	3999	52
Jembatan RS. SP Tengg	458		6.00	6.720	7.320	1.157	0.404	0.464	0.744	0.650	2.980				6032	6409	56
Jembatan RS. SP Tengg	458a		6.00	6.720	7.320	1.157	0.394	0.467	-	-	-				6128	6513	56
Jembatan RS. SP Tengg	458/AM		6.00	6.720	7.320	1.157	0.483	0.543	-	-	-				5811	6188	59
Jembatan RS. SP Tengg	458A/AM		6.00	6.720	7.320	1.157	0.605	0.665	-	-	-				7248	7625	88
Jembatan RS. SP Tengg	459		8.00	8.840	9.340	1.157	0.493	0.573	0.853	0.650	2.980				9007	9594	118
Jembatan RS. SP Tengg	460		10.00	10.720	11.220	1.157	0.654	0.734	1.014	0.500	2.980				13341	13932	140
Jembatan RS. SP Tengg	460A/AM		10.00	10.720	11.220	1.157	0.688	0.768	-	-	-				12893	18484	155
Jembatan RS. Serong	461		8.00	9.200	10.3362	1.157	0.554	0.634	0.914	3.000	0.950				10911	11468	122
Jembatan RS. Ser Rel Ings	461A/AM		8.00	9.200	9.875	1.157	0.554	0.634	-	-	-				10616	11368	122
Jembatan RS. Serong	462		8.00	9.200	10.3362	1.157	0.554	0.634	0.914	0.980	3.000				10.626	11.183	119
Jembatan RS. SP Tengg	463		10.00	10.720	11.220	1.384	0.709	0.789	1.069	0.650	2.980				10.747	11.304	121
Jembatan RS. SP Tengg	464		10.00	10.740	11.340	1.157	0.606	0.696	1.066	0.740	2.314				13277	13868	140
Jembatan RS. SP Tengg	465		8.00	8.840	9.340	1.157	0.563	0.643	0.923	0.650	2.980				13026	13623	140
Jembatan RS. SP Tengg	465A/AM		8.00	8.840	9.340	1.157	0.6015	0.6815	-	-	-				9439	10.031	118
Jembatan RS. SP Tengg	466		8.00	8.840	9.340	1.157	0.563	0.643	-	-	-				8558	9550	102
Jembatan RS. SP Tengg	467		8.00	9.200	9.930	1.157	0.530	0.625	-	-	-				9455	10.103	106
Jembatan RS. SP Tengg	468		15.00	15.960	16.700	1.157	1.044	1.103	-	-	-				10720	11277	100
Jembatan RS. Kembang	469		10.00	10.720	11.220	1.157	1.008	1.088(8)	1.368(8)	0.650	2.980				26954	28025	-
Jembatan DD PL LL dibawah	470/AM		11.38	12.000	13.000	3.100	0.905	0.945	1.405	-	-				17770	18394	200
Jembatan DD Rangka	471/AM		30.00	31.200	-	-	-	-	-	-	-				-	-	-
Jembatan DD Rangka	472		35.00	36.600	37.500	4.600	1.2715	1.783	2.563	1.360	1.500				75417	79807	1030
Jembatan DD RK LL dibawah	472/AIS		35.00	36.600	37.500	4.600	1.281	1.791	2.571	-	-				78210	82600	1080
Jembatan DD Rangka	472/JIS		35.00	36.600	37.500	4.600	1.271(5)	1.783	2.563	1.360	1.500				78443	82833	1140
Jembatan RS. SP Tengg	473		8.00	8.840	9.340	1.157	0.567(5)	0.636	0.916	0.650	1.157				11838	12435	104
Jembatan RS. Kembang	474/AM		5.00	5.600	6.000	1.150	0.828	0.906	-	-	-				3890	4196	53

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Berat (kg)		Luas Cat (m ²)			
							Konstruksi	Andas Baja	Tepi Bawah Andas Beton	Panjang	Lebar	Tanpa Andas Baja	Dengan Andas Baja				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Daftar Jembatan Baja Seri B. Ne 500 Kuat untuk Rencana Muatan 1921 (Lengkap 3 Helai)																	
Helai 1																	
Jembatan Rasuk	500		2.00	2.00	-	-	-	0.680	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	501		2.00	2.600	3.000	1.150	1.150	0.725	0.900	0.550	2.250	-	-	-	620	834	10
Jembatan RS Bekas B No.40	A501		2.00	2.600	3.000	1.150	1.150	0.780	0.930	0.550	2.250	-	-	738	912	14	-
Jembatan Rasuk	502		2.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	503		2.00	2.550	2.910	1.150	1.150	0.774	0.954	0.550	2.550	-	-	606	-	13	-
Jembatan Rasuk	504		3.00	2.600	3.000	1.150	1.150	0.670	-	-	-	-	-	729	875	13	-
Jembatan Rasuk	505		3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	506		4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	507		4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	508		5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	509		5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan RS. Plat	510		6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan RS. SP Tengg	511		6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan RS. SP Tengg	512		8.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan RS. Plat	512/13aPK		8.00	8.700	9.200	1.200	1.200	1.137	1.212	-	-	-	-	6710	7050	73	-
Jembatan RS. Serong	513		8.00	9.000	10.000	1.140	1.140	0.929	1.009	-	-	-	-	10694	11251	112	-
Jembatan RS. Serong	A513AM		8.00	9.000	10.000	1.160	1.160	0.964	1.010	-	-	-	-	9436	9883	107	-
Jembatan DD. Plat	514		10.00	10.720	11.140	3.000	3.000	0.791	0.845	-	-	-	-	10922	11278	170	-
Jembatan RS. Plat	515		10.00	10.720	11.320	1.250	1.250	1.471	1.525	-	-	-	-	7769	8125	100	-
Jembatan RS. Plat	A515		10.00	10.720	11.320	1.250	1.250	1.371	1.425	-	-	-	-	7220	7576	98	-
Jembatan DD. Plat	516		12.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD. Plat	517		12.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan RS. Plat	518		15.00	15.960	16.360	3.400	3.400	0.867	0.986	0.960	0.960	-	-	22796	23836	276	-
Jembatan DD RK Terbuka	A518B		15.00	15.960	16.810	4.600	4.600	0.940	1.033	0.960	0.960	-	-	18944	19524	285	-
Jembatan DD Rangka	A518D		15.00	15.960	16.810	4.600	4.600	0.762	0.855	0.960	0.960	-	-	22315	22895	350	-
Jembatan DD Rangka	A518E		15.00	15.960	16.810	4.600	4.600	0.952	1.041	0.960	0.960	-	-	20020	20600	290	-
Jembatan DD Rangka	A518F		15.00	15.960	16.810	4.600	4.600	0.940	1.063	0.960	0.960	-	-	20151	20871	285	-
Jembatan DD Rangka	A518B/AM		15.00	15.960	16.810	4.600	4.600	0.952	1.041	0.960	0.960	-	-	20020	20600	290	-
Jembatan DD Rangka	A518D/AM		15.00	15.960	16.810	4.600	4.600	0.763	0.852	0.960	0.960	-	-	22583	23163	350	-
Jembatan DD RK Terbuka	519		15.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD RK LL diatas	520		20.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD RK SP dibawah	521		20.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD Rangka	522		25.00	26.100	27.110	4.600	4.600	0.765	1.132	1.100	1.400	-	-	52250	54755	700	-
Jembatan DD Rangka	522AM		25.00	26.100	27.100	4.600	4.600	0.765	1.150	1.100	1.400	-	-	52192	54697	700	-
Jembatan DD Rangka	523		25.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD Rangka	524		30.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Konsol Ujung Sampai Tumpu	Ujung Rasuk Pokok Sampai Tumpu	Jarak Kesisi Antara 2 Jembatan	Berat (kg)		Luas Cat (m ²)
							Konstruksi	Andas Baja	Tepi Bawah Andas Beton	Panjang	Lebar				Tanpa Andas Baja	Dengan Andas Baja	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Helai 2																	
Jembatan DD RK LN diatas	525		30.00	31.200	31.700	3.500	4.832	5.349	-	-	-	-	-	-	-	-	-
Jembatan DD Rangka	526		35.74	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD Rangka	527		40.00	41.400	42.480	4.800	1.486	2.326	3.150	1.400	1.600	-	-	-	129828	140053	1500
Jembatan Leng LL baw don by tarik	528		40.00	41.400	42.780	4.000	7.9735	3.139	3.969	1.400	1.600	-	-	-	97535	1011332	13.
Jembatan DD RK LN diatas	529		40.00	41.400	42.200	3.500	7.855	4.945	-	-	-	-	-	-	88410	92185	1470
Jembatan DD RK SP dibawah	529/AM		40.00	41.400	42.200	3.500	7.855	4.945	-	-	-	-	-	-	-	-	-
Jembatan DD Rangka	530		50.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD Rangka	531		50.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD RK SP dibawah	532		60.00	61.600	63.410	4.600	1.543	2.121	-	-	-	-	-	-	195010	199885	2310
Jembatan DD Rangka	533		60.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan DD Rangka	534		70.00	72.000	73.600	4.800	1.462	2.393	-	-	-	-	-	-	294371	307085	3560
Jembatan DD RK SP dibawah	534		70.00	72.000	73.600	4.800	1.462	2.393	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	550		2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	551		2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	552		2.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	553		2.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan Rasuk	554		3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan RS Bekas B No.40	555		3.00	3.600	4.000	1.150	0.731	0.780	0.930	2.250	0.550	-	-	-	1167	1348	17
Jembatan RS Bekas B No.96	A555		3.00	3.600	4.000	1.180	0.720	0.800	0.950	2.250	0.550	-	-	-	1401	1706	19
Jembatan Rasuk	556		4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan RS Bekas B No.96	557		4.00	4.600	5.000	1.150	0.776	0.825	1.025	2.440	0.550	-	-	-	1791	1993	26
Jembatan Rasuk	558		5.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jembatan RS Bekas B No.86	559		5.00	5.600	6.000	1.180	0.751	0.800	1.000	2.440	0.550	-	-	-	2611	2983	32
Jembatan RS PL Bekas B.3b	A559		5.00	5.600	6.050	1.200	0.931	1.030	1.230	2.440	0.550	-	-	-	3209	3619	42
Jembatan RS. SP Tengg Bekas B.90b	560		6.00	6.800	7.300	1.157	0.445	0.525	0.775	2.700	0.650	-	-	-	6330	6927	75
Jembatan RS. SP Tengg	561		6.00	-	-	-	-	-	-	-	-	-	-	-	-	-	82
Jembatan RS. SP Tengg	562		8.00	8.928	9.340	1.157	0.476	0.525	0.775	2.980	0.650	-	-	-	6195	10358	94
Jembatan RS PL Bekas B.21b	562/I		8.00	8.720	9.354	3.000	0.711	0.795	1.285	0.920	0.720	-	-	-	9155	9660	120
Jembatan RS. SP Tengg	A/562		8.00	8.840	9.340	1.157	0.805	0.554	0.834	2.700	0.650	-	-	-	11578	12175	105
Jembatan RS. SP Tengg	A/562/A		8.00	8.840	9.340	1.157	0.805	0.854	1.134	2.700	0.650	-	-	-	10057	10634	103
Jembatan RS. Plat	563		8.00	8.720	9.354	1.200	1.161	1.250	1.500	0.650	2.700	-	-	-	5453	5975	-
Jembatan RS. SP Tengg	563A		8.00	8.700	9.400	1.200	1.191	-	-	-	-	-	-	-	6228	-	82
Jembatan RS. Plat	A563		8.00	8.720	9.354	1.200	1.159	-	-	-	-	-	-	-	6092	-	65
Jembatan DD PL LL dibawah	564		10.00	10.720	11.320	3.000	0.765	0.853	1.403	0.720	1.040	-	-	-	12213	12741	160
Jembatan RS. Plat	565		10.00	10.720	11.320	1.250	1.337	1.424	1.285	0.650	2.700	-	-	-	7.799	8.337	104
Jembatan RS. Plat	A565		10.00	10.720	11.320	1.250	1.341	1.424	1.285	0.650	2.700	-	-	-	8589	8685	104

Jenis Jembatan	Nomor Gambar B. No	Konstruksi	Bentang (M)	Bentang Teori (M)	Panjang Konstruksi SKS (M)	Lebar Jembatan SKS (M)	Tinggi dari Kop Rel ± 0.00			Bidang Dasar Andas Beton		Konsol Ujung Sampai Tumpu	Ujung Rasuk Pokok Sampai Tumpu	Jarak Kesisi Antara 2 Jembatan	Berat (kg)		Luas Cat (m ²)
							Konstruksi	Andas Baja	Tepi Bawah Andas Beton	Panjang	Lebar				Tanpa Andas Baja	Dengan Andas Baja	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Jembatan RS. Plat	A565/PK		10.00	10.750	11.250	1.250	1.361	1.395	1.645	0.650	2.700				8434	8714	105
Jembatan RS. Plat	A565/PK/I		10.00	-	-	-	-	-	-	-	-				-	-	-
Jembatan RS. Plat	A565/PK/a		10.00	10.750	11.250	1.250	1.366	1.397	1.677	0.650	2.700				8791	9071	105
Jembatan DD. Plat	566		12.00	12.960	13.520	3.000	0.836	0.927	1.417	0.920	0.920				17881	18735	208
Jembatan DD. Plat	566		11.38	12.000	13.000	2.900	0.812	-	-	-	-				-	-	-
Jembatan RS. Plat	567		12.00	12.960	13.560	1.250	1.603	1.715	1.965	0.650	2.700				10065	10967	143
Jembatan RS. Plat	A567		12.00	12.960	13.560	1.400	1.817	1.933	2.183	0.650	2.700				12607	13650	154
Jembatan RS. Plat	A567/PK		12.00	12.800	13.200	2.000	1.790	1.593	1.843	0.650	2.700				16187	16687	221
Jembatan DD RK Terbuka	568		15.00	-	-	-	-	-	-	-	-				-	-	-
Jembatan RS. Plat	569		15.00	15.960	16.620	1.400	1.829	1.933	1.963	0.650	2.700				15107	16.204	197
Jembatan DD RK LN diatas	570		20.00	21.200	22.000	4.400	8.847	1.244	1.826	1.100	1.100				38921	41260	445
Jembatan RS. Rangka	571		20.00	21.200	21.880	1.500	2.800	1.511	1.911	1.100	2.700				24560	26649	240
Jembatan RS. Rangka	A571A		20.00	21.200	21.880	1.500	5.902	1.511	1.911	1.100	2.700				25962	28090	290
Jembatan DD RK LN dibawah	a571/PK		20.00	21.200	21.380	2.300	2.791	3.237	2.817	1.100	1.100				-	-	-
Jembatan RS. Rangka	572		25.00	26.160	26.940	4.400	0.915	1.296	1.826	1.000	1.000				53577	56293	615
Jembatan RS. Rangka	572AM		25.00	26.160	26.940	4.400	0.915	1.276	1.826	1.000	1.000				57255	59894	615
Jembatan DD. Rangka	573		25.00	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD RK LN diatas	574		30.00	31.250	31.850	4.400	1.080	1.497	2.277	1.200	1.500				63386	66346	896
Jembatan RS. Rangka	575/PK		30.00	31.100	31.490	3.500	4.520	4.504	5.284	1.200	1.500				73546	75879	905
Jembatan DD. Rangka	576		35.74	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD. Rangka	577		35.74	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD. Rangka	578		40.00	41.400	42.000	4.400	1.114	1.543	2.473	1.400	1.600				-	-	-
Jembatan DD. Rangka	579		40.00	41.400	42.000	3.700	6.615	2.550	-	-	-				103933	108370	1265
Jembatan RS. Rangka	579/AM		40.00	41.400	-	-	-	-	-	-	-				-	-	-
Jembatan RS. Rangka	579		40.00	41.400	-	-	-	-	-	-	-				-	-	-
Jembatan DD. Rangka	580		50.00	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD. Rangka	58		50.00	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD. Rangka	582		60.00	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD. Rangka	583		60.00	-	-	-	-	-	-	-	-				-	-	-
Jembatan DD. Rangka			60.00												184736		
Jembatan DD. Rangka			90.00												277104		

Helai 3

Daftar Notasi

		English
BA	Bangunan Atas	Superstructure
Ras.dl	Rasuk dlurung	I beam (deck girder)
Ras.pel	Rasuk pelat	Plate girder
Ras.kmb	Rasuk kembar	Double girder
Ras.spt	Rasuk sepur tenggelam	Through girder
Ras.rk	Rasuk rangka	Truss girder
Dind.pel	Dinding pelat	Through plate girder
Dd.rk.ilb	Dinding rangka terbuka	Pony truss
Dd.rk.ttp	Dinding rangka tertutup	Through Truss girder
Dd.rk.lla	Dinding rangka lalu lintas atas	Deck truss girder
Dd.rk.ser.ilb	Dinding rangka serong terbuka	
Dd.rk.lengk	Dinding rangka lengkung	
Dd.rk.pr	Dinding rangka parabol	Parabolic truss girder
Bet.bert	Beton bertulang	Reinforced concrete
Bet.bert.emb	Beton bertulang embeded	
Cet.bert.comp	Beton bertulang komposit	Composite
BB	Bangunan bawah	Substructure
Pa.bk.ls	Pangkal batu kali langsung	
Pa.bk.sm	Pangkal batu kali sumuran	
Pa.bet.T	Pangkal beton telapak	
Pa.bet.sm	Pangkal beton sumuran	
Pa.bet.tp	Pangkal beton tiang pancang	
Pi.bk.ls	Pilar batu kali langsung	
Pi.bk.sm	Pilar batu kali sumuran	
Pi.bet.sm	Pilar beton sumuran	
Pi.bet.tp	Pilat beton tiang pancang	
BC	Box culvert	
Bentang	Jarak antara muka pangkal sampai muka pangkal	
Bentang teori	Jarak antara as andas sampai as andas.	

LINTAS : PRABUMULIH - MUARAENIM - LAHAT

DLJ.No.52	No Urut	BH	Letak Km	Bentang (m)		MACAM		No. Seri	Dipasang Tahun	Diperkuat Tahun	Jari-jari dan lereng	Kali/Curah	Luas Cat m ²	Di Cat		Jumlah Bantalan	Berat Jemb baja kg	Vol. Jemb Bet.m ³	Volume Pa/Pi.m ³	catatan	
				hulu	hilir	BA	BB							Bln/Thn	Bln/Thn						
444																					
							PRABUMULIH KM. 322 + 295														
1	730		323+510	0.8			Pipa besi		1913	1911											
2	731		323+841	1			Duiker		1913	1911											
3	732		324+438	0.7			Cemen koker		1913	1911											
4	733		324+893	1.5			Duiker		1913	1911											
5	733a		325+227	0.3			Pipa besi		1913	1911											
				0.3			Pipa besi		1913	1911											
6	734		325+326	0.7			Cemen koker		1913	1911											
7	735		325+530	2			Pelat beton		1913	1911											
8	736		326+081	1			Pelat beton		1913	1911											
9	737		326+486	1			Duiker		1913	1911											
10	738		326+610	0.7			Saluran terbuka		1913	1911											
				0.7			Saluran terbuka		1913	1911											
11	739		327+077	0.7			Saluran terbuka		1913	1911											
12	740		327+523	1			Duiker		1913	1911											
13	741		327+885	1			Duiker		1913	1911											
14	742		328+117	0.5			Cemen koker		1913	1911											
15	743		328+478	0.7			Cemen koker		1913	1911											
16	744		328+719	1			Duiker		1913	1911											
17	745		329+012	1			Box culvert		1913	1911											
18	746		329+401	0.7			Saluran terbuka		1913	1911											
19	747		329+835	0.7			Cemen koker		1913	1911											
20	748		330+083	1			Pelat beton		1913	1911											
21	749		330+293	0.7			Cemen koker		1913	1911											
22	750		330+481	0.5			Pipa besi		1913	1911											
23	751		330+739	0.5			Pipa besi		1913	1911											
24	752		330+935				Pa.bk.ls		1913	1911											
				15			Ras.pel		1913	1911											
								B.no.869/B.81	1985	BA	(-) 1/200	Aer Sedapi	180			27	15300	-	466		
									1913	1911											
25	753		331+386	0.7			Pa.bk.ls		1913	1911											
26	754		331+629	1			Cemen koker		1913	1911											
27	755		332+099	1.2			Duiker		1913	1911											
28	756		332+290	0.9			Duiker		1913	1911											
29	756a		332+556	1.2			Cemen koker		1913	1911											
30	757		333+038	1.2			Duiker		1913	1911											
							Penimur Km. 333 + 428														
31	758		333+485	0.7			Cemen koker		1913	1911											
32	759		333+891	1.2			Duiker		1913	1911											
33	760		334+854	1			Duiker		1913	1911											
34	761		334+222	1			Duiker		1913	1911											

LINTAS : PRABUMULIH - MUARAENIM - LAHAT

DLJ.No.52	LINTAS : PRABUMULIH - MUARAENIM - LAHAT																				
	No Urut	B H No	Letak Km	Bentang (m) hulu	Emp	MACAM	No. Seri	Dipasang Tahun	R M	Diperkuat Tahun	R M	Jari-jari dan lereng	Kali/Curah	Luas Cat m2	Di Cat Bln/Tmn	Jumlah Bantalan	Berat Jemb baja kg	Vol. Jemb Bet.m3	Volume Pa/Pi.m3	catatan	
35	762		335+645	1.2		Duiker			1913	1911											
36	763		335+975	0.5		Cemen koker		1913	1911												
37	764		336+192	4		Duiker		1913	1911												
38	765		336+675	1.25		Duiker		1913	1911												
39	766		336+957	0.5		Duiker		1913	1911												
40	767		337+259	0.9		Armco		1913	1911												
41	768		337+588	1.5		Duiker		1913	1911												
42	769		337+979	1.5		Armco		1913	1911												
43	770		338+545	0.7		Cemen koker		1913	1911												
44	771		338+819	1		Armco		1913	1911												
45	772		339+832	1		Duiker		1913	1911												
46	773		340+015	0.5		Cemen koker		1913	1911												
47	774		340+760			Pa.bk.ls		1913	1911	1990	1921		Linau	489		36	36484	-	1028		
				20		Dd.rk.llb	B.no.870/B.83	1984	BA												
						Pa.bk.ls		1913	1911	1990	1921										
48	775		341+198	0.5		Cemen koker		1913	1911												
49	776		341+492	0.5		Cemen koker		1913	1911												
50	777		341+648	8		Box culvert		1996	1921				Patukan	-					99		
51	779		342+369	0.3		Cemen koker		1913	1911												
52	780		342+785	0.5		Cemen koker		1913	1911												
53	781		343+106	0.5		Cemen koker		1913	1911												
54	782		343+408	0.5		Duiker		1913	1911												
55	783		341+980			Pa.bk.ls		1913	1911	1990	1921										
				4		Bet.bert	Byb.no.808	1985	BA										8	80	
						Pa.bk.ls		1913	1911	1990	1921										
56	783		343+780	1.8		Duiker		1913	1911												
57	784		344+170	2.1		Box culvert		2000	1921												
58	784		344+170	0.5		Cemen koker		1913	1911												
59	785		344+599			Pa.bk.ls		1913	1911	1990	1921										
				40		Dd.rk.ttp	B.no.878/B.92	1983	BA				Niru	1198		71	88252	-	1217		
60	785a		344+599			Pa.bk.ls		1913	1911	1990	1921										
						Pa.bet.ls		1999	1921												
				40		Dd.rk.ttp	B.no.578a/B.92	1999	1921												
61	785a		344+778	0.25		Pa.bet.ls		1999	1921												
62	785a		344+874	0.25		Cemen koker		1913	1911												
63	786		345+135	0.8		Cemen koker		1913	1911												
64	787		346+910	1		Duiker		1913	1911												
65	788		346+878	1		Duiker		1913	1911												
66	789		347+110	0.5		Cemen koker		1913	1911												

LINTAS : PRABUMULIH - MUARAENIM - LAHAT

No Urut	B H No	Letak Km	Bentang (m) hulu hilir	MACAM		No. Seri	Dipasang		Diperkuat Tahun R M	Jari-jari dan lereng	Kali/Curah	Luas Cat m2	Di. Cat		Berat Jemb baja kg	Vol. Jemb		Volume Pa/Pi.m3	catatan		
				BA	BB		Tahun	R M					Bln/Thn	Bln/Thn		Bet.m3	Pa/Pi.m3				
																				Emp	Emp
67	790	347+721	1		Duiker	1913	1911														
68	791	348+119	0.5		Cemen koker	1913	1911														
69	792	348+422	1		Armco	1913	1911														
70	793	348+746	0.5		Cemen koker	1913	1911														
71	794	348+960	0.5		Cemen koker	1913	1911														
72	795	348+002	0.3		Cemen koker	1913	1911														
73	795a	348+015	0.3		Cemen koker	1913	1911														
74	796	349+179	0.5		Cemen koker	1913	1911														
75	797	349+353	0.5		Cemen koker	1913	1911														
76	798	349+518	0.5		Cemen koker	1913	1911														
77	800	350+380	1		Duiker	1913	1911														
78	801	350+648	0.5		Cemen koker	1913	1911														
79	802	350+773	0.7		Cemen koker	1913	1911														
80	803	351+082	1		Duiker	1913	1911														
81	804	351+832	0.5		Cemen koker	1913	1911														
82	805	352+295	4.95		Armco	1985	BA														
			4.95		Armco	1985	BA														
83	805	352+784	0.3		Cemen koker	1913	1911														
84	806	352+780	0.3		Cemen koker	1913	1911														
85	807	352+883	0.5		Cemen koker	1913	1911														
86	808	353+500	0.5		Cemen koker	1913	1911														
87	809	353+712	1		Duiker	1913	1911														
88	810	353+889	0.5		Cemen koker	1913	1911														
89	811	354+677			Pa.bk.lsl	1913	1911	1990	1921												
			5		Bet.bert	1985	BA										9.1		272		
					Pa.bk.lsl	1913	1911	1990	1921												
90	811	354+505	0.7		Open doortlat	1913	1911														
91	813	355+946	2.25		Armco	1985	BA														
			2.25		Armco	1913	1911														
92	814	356+167	0.3		Cemen koker	1913	1911														
93	816	357+179	0.3		Cemen koker	1913	1911														
94	817	357+412			Pa.bk.lsl	1913	1911	1990	1921												
			5		Bet.bert	1985	BA														
					Pa.bk.lsl	1913	1911	1990	1921								9.1		304		
95	818	357+870			Pa.bk.lsl	1913	1911	1990	1921												
			8		Bet.bert	1985	BA														
					Pa.bk.lsl	1913	1911	1990	1921												
96	819	358+718	1		Duiker	1913	1911														
97	820	359+471			Pa.bk.lsl	1913	1911	1990	1921												

Blimbing Km. 354 + 344

LINTAS : PRABUMULIH - MUARAENIM - LAHAT

DLJ.No.52		LINTAS : PRABUMULIH - MUARAENIM - LAHAT																	
No Urut	B H	Letak Km	Bentang (m)		MACAM		No. Seri	Dipasang		Diperkuat	Jari-jari dan lereng	Kali/Curah	Luas Cat m ²	Di Cat		Berat Jemb baja kg	Vol. Jemb Bet.m ³	Volume Pa/Pi.m ³	catatan
			hulu	hilir	B A	B B		Tahun	R M					Tahun	R M					Bln/Thn	Bln/Thn
			5		Bet.bert		Byb.no.810	1984	BA	1990	1921	Suban	-			-	9.1	292	
98	821	359+878	0.5		Pa.bk.ls			1913	1911	1990	1921								
99	822	360+242	0.5		Cemen koker			1913	1911										
100	823	360+477	0.5		Pipa besi			1913	1911										
			0.5		Pipa besi			1913	1911										
101	824	360+867	1		Duiker			1913	1911										
102	825	361+185	0.5		Beton buis			1913	1911										
103	826	361+620			Pa.bk.ls		Byb.no.812	1913	1911	1990	1921	1000	Jelai	-	-	13.02	284		
			6		Bet.bert			1985	BA										
104	827	362+130	3.5		Pa.bk.ls			1913	1911	1990	1921								
105	827	362+131	3.5		Armco			1985	BA										
106	828	362+427	0.5		Armco			1985	BA										
107	829	362+662	0.5		Beton buis			1913	1911										
108	830	363+256	0.7		Beton buis			1913	1911										
109	831	364+008			Pa.bet.sm			1913	1911	1990	1921								
			20		Dind.pel		B.no.483 A	1997	1921	1990	1921		Rekukan	369		48784	-	808	
			30		Dd.rk.llb		B.no.446 E/I	1913	1911	1990	1921			900		63499	-		
110	832	364+631	0.5		Pa.bet.sm			1913	1911	1990	1921								
111	832a	364+928	0.5		Beton buis			1913	1911										
112	833	365+334	1		Beton buis			1913	1911										
113	834	365+700	0.25		Duiker			1913	1911										
114	835	365+930	1.5		Pipa besi			1913	1911										
115	836	366+525	3		Duiker			1913	1911										
116	836	366+521	3		Armco			1985	BA										
					Armco			1985	BA										
Gunung Megang Km. 367 + 039																			
117	837	367+461			Pa.bk.ls			1913	1911	1990	1921								
			50		Dd.rk.ttp		B.no.880/B.101	1985	BA							127417	-	189	
118	838	367+954	0.5		Pa.bk.ls			1913	1911	1990	1921								
119	839	369+183	1		Cemen koker			1913	1911										
					Duiker			1913	1911	2003	1921								
120	840	368+598	0.5		Beton buis			1913	1911										
121	841	368+772	0.5		Beton buis			1913	1911										
122	842	369+065	1		Duiker			1913	1911										
123	843	369+340	0.7		Beton buis			1913	1911										
124	844	369+640	0.5		Beton buis			1913	1911										
125	845	369+875	0.5		Beton buis			1913	1911										
126	846	369+911	0.7		Beton buis			1913	1911										

LINTAS : PRABUMULIH - MUARAENIM - LAHAT

No Urut	B H Urut	Letak Km	Bentang (m)		MACAM		No. Seri	Dipasang Tahun	R M	Diperkuat Tahun	R M	Jari-jari dan lereng	Kali/Curah	Luas Cat m2	Di Cat		Berat Jemb baja kg	Vol. Jemb Bet.m3	Volume Pa/Pi.m3	catatan	
			hulu	hilir	BA	BB									Bln/Thn	Bln/Thn					
127	847	370+280	1			Duiker		1913	1911												
128	848	370+503	0.5			Beton buis		1913	1911												
129	850	370+880	0.5			Beton buis		1913	1911												
130	851	371+274	0.5			Armco		1913	1911												
131	852	371+406	1			Duiker		1913	1911												
132	853	371+997	0.5			Beton buis		1913	1911												
133	854	372+180	1			Duiker		1913	1911												
134	855	372+495	0.5			Beton buis		1913	1911												
135	856	373+068	1			Armco		1913	1911												
136	857	373+581	0.5			Beton buis		1913	1911												
137	858	373+946	0.5			Beton buis		1913	1911												
138	859	374+173	1			Duiker		1913	1911	2003	1921										
			1			Duiker		1913	1911	2003	1921										
Pamanggilan Km. 374 + 446																					
139	860	374+853	0.5			Beton buis		1913	1911												
140	861	375+207	0.5			Beton buis		1913	1911												
141	862	375+402	0.7			Beton buis		1913	1911												
142	863	376+823	1			Duiker		1913	1911												
143	864	376+132	0.5			Armco		1913	1911												
144	865	376+516	0.5			Beton buis		1913	1911												
			0.5			Beton buis		1913	1911												
145	866	376+955	0.8			Beton buis		1913	1911												
146	867	377+252	0.5			Beton buis		1913	1911												
147	868	377+487	0.5			Duiker		1913	1911												
148	869	378+327	1			Duiker		1913	1911												
149	870	378+596				Pa.bk.ls		1913	1911	1990	1921										
			4			Bet.bert		1985	BA												
						Pa.bk.ls		1913	1911	1990	1921										
150	871	379+235				Pa.bk.ls		1913	1911	1990	1921										
			4			Bet.bert		1985	BA												
						Pa.bk.ls		1913	1911	1990	1921										
151	872	379+784	0.5			Beton buis		1913	1911												
152	873	380+083	0.5			Gorong-gorong		1913	1911	2003	1921										
153	874	380+204	0.2			Pipa besi		1913	1911												
154	875	380+365	0.2			Cemen koker		1913	1911												
155	876	380+538	0.5			Cemen koker		1913	1911												
156	877	380+758	0.5			Cemen koker		1913	1911												
Ujanmas Km. 381 + 529																					
157	878	381+529	0.75			Cemen koker		1913	1911												

LINTAS : PRABUMULIH - MUARAENIM - LAHAT

DLJ.No.52		LINTAS : PRABUMULIH - MUARAENIM - LAHAT															catatan				
No Urut	B H	Letak Km	Bentang (m)		MACAM		No. Seri	Dipasang		Diperkuat	Jari-jari dan lereng	Kali/Curah	Luas Cat m2	Di. Cat		Jumlah Bantalan	Berat Jemb baja kg	Vol. Jemb		Volume Pa/Pi.m3	
			hulu	hilir	BA	BB		Tahun	R M					Bln/Thn	Bln/Thn			Bet.m3	Pa/Pi.m3		
158	879	381+821	0.8					1913	1911												
159	880	382+371	0.8					1913	1911												
160	881	383+110	0.8					1913	1911												
161	882	383+192	0.6					1913	1911												
162	883	383+849	0.5					1913	1911												
163	884	383+938	0.6					1913	1911												
164	885	384+070	0.5					1913	1911												
165	886	384+294	3					2000	1921								-			26.65	
166	887	384+454	0.5					1913	1911												
167	888	384+959	1					1913	1911												
168	889	385+151	0.3					1913	1911												
169	890	385+293	0.7					1913	1911												
170	891	385+450	0.6					1913	1911												
171	892	385+524	0.5					1913	1911												
172	893	386+151	0.3					1913	1911												
173	894	386+320	1					1913	1911												
174	894a	386+446	0.45					1913	1911												
175	894b	386+660	0.8					1913	1911												
176	895	386+752	0.8					1913	1911												
177	896	387+117						1913	1911	1990	1921										
			15					B.no.868/B.391	1985	BA			294			27	24333	-		254	
178	898	387+519	0.3					1913	1911	1990	1921										
								1913	1911												
179	899	388+795	6.5					1990	BA												
180	899	388+789	0.9					1913	1911												
181	900	389+472	0.6					1913	1911												
182	902	390+137	0.3					1913	1911												
183	903	390+407	0.7					1913	1911												
184	904	39+494	0.7					1913	1911												
185	905	390+770	0.7					1913	1911												
186	906	391+652	0.7					1913	1911												
187	907	392+211						1913	1911	1990	1921										
			12					B.no.866/B.201	1985	BA			183			21	16258	-		488	
								1913	1911	1990	1921										
188	907a	393+350	0.8					1913	1911												
189	907b	393+517	0.75					1913	1911												
190	908	398+228	0.5					1913	1911												
191	910	394+675	0.5					1913	1911												

LINTAS : PRABUMULIH - MUARAENIM - LAHAT

DLJ.No.52		LINTAS : PRABUMULIH - MUARAENIM - LAHAT																				
No Urut	B H	Letak Km	Bentang (m)		MACAM		No. Seri	Dipasang		Diperkuat	Jari-jari dan lereng	Kali/Curah	Luas Cat m2	Di Cat		Jumlah Bantalan	Berat Jemb baja kg	Vol. Jemb Bet.m3	Volume Pa/P1.m3	catatan		
			hulu	hilir	BA	BB		Tahun	R M					Tahun	R M						Bln/Thn	Bln/Thn
31	946	403+751	0.7					1913	1911													
32	947	404+213	0.7					1913	1911													
33	948	404+337	2.5					1913	1911													
34	949	404+702	0.7					1913	1911													
35	950	404+882	0.9					1913	1911													
36	951	405+602	3					1913	1911													
37	952	405+870	0.7					1913	1911													
38	953	406+316						1913	1911	1990	1921											
					Bet.Com		B.Com.	1985	BA							-	-	31.3	340			
39	954	406+434	0.9					1913	1911	1990	1921											
40	955	407+025	3					1913	1911													
41	955a	407+176	0.3					1913	1911													
42	956	407+440	0.7					1913	1911													
43	957	407+566	0.7					1913	1911													
44	958	407+628						1913	1911	1990	1921											
								1985	BA													
					Bet.bert		Byb.no.812	1913	1911	1990	1921											
								1913	1911	2003	1921											
45	960	407+806	2					1913	1911													
46	961	408+091	2					1913	1911													
47	962	408+561	0.9					1913	1911													
48	962a	408+617	0.9					1913	1911	2003	1921											
49	963	408+951	0.9					1913	1911													
50	964	409+387	3					1913	1911													
51	965	409+504	0.7					1913	1911													
52	966	409+748	1.5					1913	1911													
53	967	409+880	1					1913	1911													
54	968	410+405	2.5					1913	1911													
55	969	410+618	0.7					1913	1911													
56	970	410+780	0.9					1913	1911													
57	971	410+988	1					1913	1911													
58	973	411+298	0.7					1913	1911													
59	974	411+506	0.9					1913	1911													
60	975	411+934	3					1913	1911													
61	976	412+370	0.7					1913	1911													
62	977	412+480	4.4					1985	BA													
								1985	BA													
63	977	412+480	0.45					1913	1911													
64	978	413+423	2.5					1913	1911	2003	1921											
65	979	413+981	1					2003	1921													

LINTAS : PRABUMULIH - MUARAENIM - LAHAT

DLJ.No.52		LINTAS : PRABUMULIH - MUARAENIM - LAHAT																				
No Urut	B H No	Letak Km	Bentang (m)		MACAM		No. Seri	Dipasang		Diperkuat Tahun R M	Jari-jari dan lereng	Kali/Curah	Luas Cat m2	Di Cat		Berat Jemb baja kg	Vol. Jemb Bet.m3	Volume Pa/Pi.m3	catatan			
			hulu	hilir	BA	BB		Tahun	R M					Bln/Thn	Bln/Thn							
66	980	414+312	0.7					1913	1911													
67	981	414+553	3					1913	1911													
68	982	414+920	2.5					1913	1911													
69	983	415+178	1					1913	1911													
70	984	416+261	1					1913	1911													
71	985	416+567	1					1913	1911													
72	986	416+643	2.5					1913	1911													
73	987	416+902			Ras.rk		B.no.871/B.82	1985	BA			Aer Kungkulan	243			36	28258	-	131			
			20					1913	1911	1990	1921											
74	988	417+102	1					1913	1911													
75	989	417+347	0.9					1913	1911													
76	990	417+508	0.7					1913	1911													
77	991	417+7/8	0.7					1913	1911													
78	992	417+8/9	0.7					1913	1911													
79	993	418+0/1	0.9					1913	1911	2003	1921											
80	994	418+8/9	2					1913	1911													
81	995	419+0/1	0.9					1913	1911													
			0.9					1913	1911													
82	996	419+3/4	1					1913	1911													
83	997	419+423	1					1913	1911	2003	1921											
84	998	419+893						1913	1911	1990	1921											
			60			Dd.rk.ttp	B.no.882/B.79a	1984	BA				2193			105	193527	-				
			40			Dd.rk.ttp	B.no.878/B.92	1984	1911	1990	1921											
								1913	BA													
			30			Dd.rk.ttp	B.no.874/B.78t	1984	1911	1990	1921											
								1913	1911	1990	1921											
			30			Dd.rk.ttp	B.no.874/B.78t	1984	BA													
								1913	1911	1990	1921											
85	998	419+4/5	2					1913	1911													
86	999	420+2/3	0.9					1913	1911													
87	1000	420+3/4	2					1913	1911													
88	1001	420+3/4	2					1913	1911													
89	1001a	420+8/9	0.7					1913	1911													
90	1001b	420+8/9	0.7					1913	1911													
91	1002	421+3/4	0.7					1913	1911													
92	1003	421+6/7	1					1913	1911													
93	1004	421+7/8	1					1913	1911													
94	1005	421+9/0	2					1913	1911													
95	1006	422+2/3	0.9					1913	1911													
96	1007	423+3/4	0.9					1913	1911													
			0.9					1913	1911													

LINTAS : PANJANG - PRABUMULIH - KERTAPATI

DLJ.No.51		LINTAS : PANJANG - PRABUMULIH - KERTAPATI																		
No Urut	B H Urut	Letak Km	Bentang (m)		MACAM		No. Seri	Dipasang		Diperkuat	Jari-jari dan lereng	Kali/Curah	Luas Cat m2	Di cat Blnr/Th	Jumlah Bantalan	Berat Jemb baja kg	Vol. Jemb bet m3	Volume Pa/Pi m3	catatan	
			hulu	hilir	B A	B B		Tahun	R M											Tahun	R M
			PRABUMULIH Km. 322 + 295																	
1	639	322+5/6	2					1996	1921											
2	640	322+568	1					1913	1911											
3	641	322+960	0.7					1913	1911											
4	642	323+002	1					1913	1911											
5	643a	323+617	0.6					1913	1911											
6	644	324+307	1					1913	1911											
7	645	324+381	0.5					1913	1911											
8	646	325+367	2					1913	1911											
9	647	325+707	0.5					1913	1911											
10	648	326+911	0.5					1913	1911											
11	649	326+531	2					1913	1911											
12	650	329+081	0.5					1913	1911											
13	651	329+804	0.5					1913	1911											
14	652	331+803	2					1913	1911											
15	653	332+948	0.5					1913	1911											
16	654	334+159	0.5					1913	1911											
17	655	335+158	0.5					1913	1911											
18	656	336+310	0.5					1913	1911											
19	657	336+795	2					1913	1911											
20	658	336+456	0.5					1913	1911											
21	659	337+891	3					1913	1911											
			L e m b a k Km. 338 + 090																	
22	660	338+680	18*3					1913	1911											
23	661	338+826	0.44					1913	1911											
24	662	339+409	1.5					1913	1911											
25	663	339+500	0.7					1913	1911											
26	664	340+565	0.5					1913	1911											
27	665	341+688	0.7					1913	1911											
28	666	342+588	2					1913	1911											
29	667	343+910	0.5					1913	1911											
30	668	344+431	2					1913	1911	2003	1921		23							
31	669	345+213	0.7					1913	1911											
			Karagendah Km. 345 + 549																	
32	670	345+863	2					1913	1911											
33	671	345+227	1					1913	1911											

LINTAS : PANJANG - PRABUMULIH - KERTAPATI

No Urut	B H Urut	Letak Km	Bentang (m)		MACAM		No. Seri	Dipasang Tahun	Diperkuat Tahun	Jari-jari dan lereng	Kali/Curah	Luas Cat m2	Di cat		Berat Jemb baja kg	Vol. Jemb bet m3	Volume Pa/Pi m3	catatan
			hulu	hilir	B A	B B							Blnr/Th	Blnr/Th				
			R	M	R	M							R	M				
34	672	346+323	2		Duiker		1913 1911											
35	673	348+572	3		Duiker		1913 1911											
36	674	349+485	3		Duiker		1913 1911											
37	675	350+208	1.5		Box Culvert		2003 1921				12							
38	676	351+321	0.7		Saluran terbuka		1913 1911											
			0.7		Saluran terbuka		1913 1911											
			0.7		Saluran terbuka		1913 1911											
39	678	351+538	1.5		Duiker		1913 1911											
40	679	352+130	1.5		Duiker		1913 1911											
41	680	353+100	1.5		Duiker		1913 1911											
42	681	353+721	0.7		Cemen koker		1913 1911											
		Gelumbang Km. 353 + 833																
43	682	354+680	1		Duiker		1913 1911											
44	683	355+432	2		Duiker		1913 1911											
45	684	356+156	1.5		Duiker		1913 1911											
46	685	358+108	2		Duiker		1913 1911											
47	686	358+875			Pa.bk.ls		1913 1911	1997	1921									
			15		Ras.dl		B.no.410 Aus	1997 1921	1997 1921		Rawatalang	176		27	18722	-	288	B-16
48	687	358+501	1		Pa.bk.ls		1913 1911	1997	1921									
49	688	358+221	1		Duiker		1913 1911											
50	689	361+472	0.7		Box Culvert		2003 1921											
51	690	362+514	1		Open doorflat		1913 1911					6						
52	691	363+303	0.7		Duiker		1913 1911											
		Serdang Km. 363 + 479																
53	692	363+991	0.5		Duiker		1913 1911											
			0.5		Duiker		1913 1911											
54	693	364+787	1.5		Duiker		1913 1911											
55	694	365+247	0.7		Cemen koker		1913 1911											
56	695	367+120	1		Box Culvert		2003 1921					8						
57	696	367+658	0.7		Cemen koker		1913 1911											
58	697	368+568	2.5		Duiker		1913 1911											
59	698	369+440	0.7		Cemen koker		1913 1911											
60	699	370+516	0.7		Cemen koker		1913 1911											
61	700	371+284	0.7		Cemen koker		1913 1911											
62	701	371+735	0.7		Cemen koker		1913 1911											
63	702	372+184	0.7		Cemen koker		1913 1911											
64	703	373+062	0.7		Cemen koker		1913 1911											
		Payakabung Km. 373 + 335																
65	704	373+999	1		Cemen koker		1913 1911											
66	705	374+081	0.7		Open doorflat		1913 1911											

LINTAS : PANJANG - PRABUMULIH - KERTAPATI

DLJ.No.51																				
No Urut	B H Letak Km	Bentang (m)		MACAM		No. Seri	Dipasang		Diperkuat Tahun	Jari-jari dan lereng	Kali/Curah	Luas Cat m2	Di cat		Berat Jemb baja kg	Vol. Jemb bet m3	Volume Pa/Pi m3	catatan		
		hulu	hilir	B A	B B		Tahun	R M					Blnr/Th	Blnr/Th						
67	706	374+663	0.9				1913	1911												
68	707	375+140	0.7				1913	1911												
69	708	376+151	2.25				1913	1911												
70	709	376+840	0.7				1913	1911												
71	710	377+558	0.7				1913	1911												
72	711	378+971	0.7				1913	1911												
73	711a	379+989	1				1913	1911												
74	712	380+491	1				1913	1911												
75	713	381+310	1.5				2003	1921												
76	714	382+325					1913	1911	1991	1921										
			8		Ras.dl	B.no.386/Ab.8-8	1991	1921	1991	1921	Plani	82		15	7039	-	260			
							1913	1911	1991	1921										
77	715	383+121					1913	1911	1997	1921										
			12.5		Ras.dl	B.no.443c/Aus	1997	1921	1997	1921	Talangburuh	154		23	16282	-	275	B-16		
							1913	1911	1997	1921										
78	716	383+835					1913	1911	1997	1921										
			15		Dind.pel	B.no.438 Aus	1997	1921	1997	1921	Rambutan	417		27	33927	-	269	C-18		
							1913	1911	1997	1921										
79	717	385+753					1913	1911	1997	1921										
			12		Dind.pel	B.no.415 Aus	1997	1921	1997	1921	Rawa bakung	288		21	24488	-	228	C-15		
							1913	1911	1997	1921										
80	718	387+038					1913	1911	1997	1921										
			40		Dd.rk.ttp	B.no.428 Aus	1998	1921	1997	1921	Simpang	1787		71	135650	-	408	E.42-4		
							1913	1911	1997	1921										
81	719	387+732	1.5				2003	1921												
82	720	389+872					1913	1911	1992	1921										
			8		Ras.dl	B.no.386/B.8-8	1992	1921	1992	1921	Rawa-rawa	82		15	9900	-	163			
							1913	1911	1992	1921										
83	721	390+786					1913	1911	1997	1921										
			12		Dind.pel	B.no.415 Aus	1997	1921	1997	1921	R.Waringin	288		21	24488	-	212	C-15		
							1913	1911	1997	1921										
84	722	392+765					1913	1911	1997	1921										
			20		Dind.pel	B.no.483 Aus	1997	1921	1997	1921	Badak	521		36	47440	-	504	C-21		
							1913	1911	1997	1921										
85	723	393+609					1913	1911	1997	1921										
			12		Ras.dl	B.no.443 Aus	1997	1921	1997	1921	Rasauw	144		21	13318	-	280	B.13-H		
							1913	1911	1997	1921										
86	724	394+259					1913	1911	1992	1921										

[Appendix 5-4-4] Track Works

1. Railway-facility rough cost of construction-1

The first stage(Single track improvement, Target transportation amount 2.5 million ton/year,395m in train organization length)

The second stage (Target transportation amount five million ton/year,615m in train organization length)

The third stage (Complete double-track line making,930m in train organization length during target transportation amount 20 million ton/year)

№	Work item	Unit	Unit price (Rp)		The first stage		The second stage		The third stage		Recapitulation
			Quantity	Cost (Rp)	Quantity	Cost (Rp)	Quantity	Cost (Rp)			
1.	Procurement										
1.1	Existing line improvement										
1.1.1	R54 Rail	ton	17,382,062	0	8,993	156,321,541,959	8,993	156,321,541,959			
1.1.2	Normal Joint Bar	set	1,953,189	0	1,469	2,869,234,641	1,469	2,869,234,641			
1.1.3	PC Sleeper & Fastening	set	1,013,517	143,596	143,596	145,536,987,132	143,596	145,536,987,132			
1.1.4	Synthetic Sleeper for Joint	set	5,394,996	0	1,469	7,925,249,124	1,469	7,925,249,124			
1.1.5	Synthetic Sleeper for Steel Bridge	set	5,394,996	670	670	3,614,647,320	670	3,614,647,320			
1.1.6	Simple Turnout R54# 12 with Conc. Sleeper	set	939,656,983	0	33	31,008,680,439	33	31,008,680,439			
1.2	Effective length extension (including double-tracking,new-line)										
1.2.1	R54 Rail	ton	17,382,062	46	3,776	794,082,120	3,776	65,630,981,115	14,528	252,520,930,184	
1.2.2	Normal Joint Bar	set	1,953,189	33	847	64,455,237	847	1,654,351,083	1,506	2,941,177,103	
1.2.3	PC Sleeper & Fastening	set	1,013,517	640	57,771	648,650,880	57,771	58,551,890,607	220,603	223,584,383,993	
1.2.4	Synthetic Sleeper for Joint	set	5,394,996	33	847	178,034,868	847	4,569,561,612	1,506	8,123,964,810	
1.2.5	Synthetic Sleeper for Steel Bridge	set	5,394,996	0	308	1,661,658,768	308	1,661,658,768	1,211	6,533,340,156	
1.2.6	Simple Turnout R54# 12 with Conc. Sleeper	set	939,656,983	0	7	6,577,598,881	7	6,577,598,881	7	6,577,598,881	
2.	Installation										
2.1	Existing line improvement										
2.1.1	Ballast delivery and spreading	m3	341,796	0	0	0	0	0	0	0	
2.1.2	Track Laying General, including initial tamping	tm	540,324	0	0	0	0	0	0	0	
2.1.3	Rail Welding	no	2,119,605	0	0	0	0	0	0	0	
2.1.4	Final Tamping (MTT), including trial operation	tm	156,360	154,899	155,899	24,219,929,460	155,899	24,376,289,460	155,899	24,376,289,460	
2.1.5	Simple Turnout clearing	set	5,224,030	0	35	182,841,050	35	182,841,050	35	182,841,050	
2.1.6	Simple Turnout installation	set	15,672,091	0	35	548,523,185	35	548,523,185	35	548,523,185	
2.2	Effective length extension (including double-tracking,new-line)										
2.2.1	Ballast delivery and spreading	m3	341,796	821	68,706	280,484,634	68,706	23,483,552,187	271,865	92,922,393,466	
2.2.2	Track Laying General, including initial tamping	tm	540,324	423	34,961	228,557,052	34,961	18,890,267,364	134,516	72,681,953,022	
2.2.3	Rail Welding	no	2,119,605	0	3,714	7,872,043,402	3,714	7,872,043,402	7,408	15,701,864,272	
2.2.4	Final Tamping (MTT), including trial operation	tm	156,360	1,000	34,538	156,360,000	34,538	5,400,361,680	133,767	20,915,729,940	
2.2.5	Simple Turnout clearing	set	5,224,030	2	0	10,448,060	0	0	5	26,120,150	
2.2.6	Simple Turnout installation	set	15,672,091	2	7	31,344,182	7	109,704,637	12	188,065,092	

№	Work item	Unit	Unit price (Rp)	The first stage		The second stage		The third stage		Recapitulation
				Quantity	Cost (Rp)	Quantity	Cost (Rp)	Quantity	Cost (Rp)	
	3. Track material replacement									
	3.1 Sleeper and trackbed replacement	m	1,155,000	26,646	30,776,361,000	26,646	30,776,361,000	26,646	30,776,361,000	
	3.2 Trackbed replacement	m	517,000	11,480	5,934,901,500	11,480	5,934,901,500	11,480	5,934,901,500	
	3.3 Sleeper replacement	m	517,000	59,768	30,900,262,800	59,768	30,900,262,800	59,768	30,900,262,800	
	3.4 Bridge sleeper replacement	m	407,000	403	163,817,500	403	163,817,500	403	163,817,500	
	3.5 Rail replacement	m	143,000	0	0	83,055	11,876,793,500	83,055	11,876,793,500	
	Railway-facility rough cost of construction	Rp			243,539,323,745		646,438,101,945		1,154,753,651,677	
		100 million yen			22.1		58.8		105.0	

2. Railway-facility rough cost of construction-2

④ idea: The coal unloading equipment is constructed in Musi river away from Simpang at about 7km.

⑤ idea: The coal unloading equipment is constructed in Mariana away from Simpang at about 35km.

⑥ idea: The coal unloading equipment is constructed in Gasing away from Simpang at about 45km.

№	Work item	Unit	Unit price (Rp)	④ idea		⑤ idea		⑥ idea		Recapitulation
				Quantity	Cost (Rp)	Quantity	Cost (Rp)	Quantity	Cost (Rp)	
	1. Procurement									
	1.1 R54 Rail	ton	17,382,062	1,064	18,491,037,556	5,364	93,243,638,110	4,186	72,762,702,097	
	1.2 Normal Joint Bar	set	1,953,189	296	578,143,944	624	1,218,789,936	528	1,031,283,792	
	1.3 PC Sleeper & Fastening	set	1,013,517	15,762	15,975,392,793	81,036	82,131,701,451	63,097	63,949,544,310	
	1.4 Synthetic Sleeper for Joint	set	5,394,996	296	1,596,918,816	624	3,366,477,504	528	2,848,557,888	
	1.5 Synthetic Sleeper for Steel Bridge	set	5,394,996	0	0	1,666	8,988,063,336	1,500	8,092,494,000	
	1.6 Simple Turnout R54# 12 with Conc. Sleeper	set	939,656,983	3	2,818,970,949	7	6,577,598,881	5	4,698,284,915	
	2. Installation									
	2.1 Ballast delivery and spreading	m ³	341,796	19,400	6,630,842,400	95,060	32,491,127,760	73,914	25,263,509,544	
	2.2 Track Laying General, including initial tamping	tm	540,324	10,000	5,403,240,000	49,000	26,475,876,000	38,100	20,586,344,400	
	2.3 Rail Welding	no	2,119,605	234	495,987,570	1,643	3,482,934,936	1,258	2,665,615,248	
	2.4 Final Tamping (MTT), including trial operation	tm	156,360	10,000	1,563,600,000	49,000	7,661,640,000	38,100	5,957,316,000	
	2.5 Simple Turnout clearing	set	5,224,030	0	0	0	0	0	0	
	2.6 Simple Turnout installation	set	15,672,091	3	47,016,273	7	109,704,637	5	78,360,455	
	Railway-facility rough cost of construction	Rp			53,601,150,301		265,747,552,551		207,934,012,649	
		100 million yen			4.9		24.2		18.9	

3. Track unit price table

No	Work item	Unit	Unit price (Rp)	Recapitulation
1.0	Procurement			
1.1	R54 Rail	ton	17,382,062	Import
1.2	Normal Joint Bar	set	1,953,189	Local
1.3	PC Sleeper & Fastenng	set	1,013,517	Local
1.4	Syntetic Sleeper for Joint	set	5,394,996	Import
1.5	Syntetic Sleeper for Steel Bridge	set	5,394,996	Import
1.6	Simple Turnout R54# 12 with Conc. Sleeper	set	939,656,983	Import & Local
2.0	Installation			
2.1	Ballast delivery and spreading	m ³	341,796	Local
2.2	Track Laying General, including initial tamping	tm	540,324	Local
2.3	Rail Welding	no	2,119,605	Material Import
2.4	Final Tamping (MTT), including trial operation	tm	156,360	Local
2.5	Simple Turnout clearing	set	5,224,030	Local
2.6	Simple Turnout installation	set	15,672,091	Local
3.0	Track material replacrmnt			
3.1	Sleeper and trackbed replacement	m	1,155,000	Local
3.2	Trackbed replacement	m	517,000	Local
3.3	Sleeper replacement	m	517,000	Local
3.4	Bridge sleeper replacement	m	407,000	Local
3.5	Rail replacement	m	143,000	Local

4. Track works Quantity summary table-1

The first stage(Single track improvement,Target transportation amount 2.5 million ton/year,395m in train organization length)

The second stage (Target transportation amount five million ton/year,615m in train organization length)

The third stage (Complete double-track line making,930m in train organization length during target transportation amount 20 million ton/year)

№	Work item	Unit	The first stage	The second stage	The third stage	Recapitulation
			Quantity	Quantity	Quantity	
	1.Procurement					
	1.1 Existing line improvement					
	1.1.1 R54 Rail	ton	0	8,993	8,993	
	1.1.2 Normal Joint Bar	set	0	1,469	1,469	
	1.1.3 PC Sleeper & Fastenng	set	143,596	143,596	143,596	
	1.1.4 Syntetic Sleeper for Joint	set	0	1,469	1,469	
	1.1.5 Syntetic Sleeper for Steel Bridge	set	670	670	670	
	1.1.6 Simple Turnout R54# 12 with Conc. Sleeper	set	0	33	33	
	1.2 Effective length extention (including double-tracking,new-line)					
	1.2.1 R54 Rail	ton	46	3,776	14,528	
	1.2.2 Normal Joint Bar	set	33	847	1,506	
	1.2.3 PC Sleeper & Fastenng	set	640	57,771	220,603	
	1.2.4 Syntetic Sleeper for Joint	set	33	847	1,506	
	1.2.5 Syntetic Sleeper for Steel Bridge	set	0	308	1,211	
	1.2.6 Simple Turnout R54# 12 with Conc. Sleeper	set	0	7	7	
	2.Installation					
	2.1 Existing line improvement					
	2.1.1 Ballast delivery and spreading	m ³	0	0	0	
	2.1.2 Track Laying General, including initial tamping	tm	0	0	0	
	2.1.3 Rail Welding	no	0	0	0	
	2.1.4 Final Tamping (MTT), including trial operation	tm	154,899	155,899	155,899	
	2.1.5 Simple Turnout clearing	set	0	35	35	
	2.1.6 Simple Turnout installation	set	0	35	35	
	2.2 Effective length extention (including double-tracking,new-line)					
	2.2.1 Ballast delivery and spreading	m ³	821	68,706	271,865	
	2.2.2 Track Laying General, including initial tamping	tm	423	34,961	134,516	
	2.2.3 Rail Welding	no	0	3,714	7,408	
	2.2.4 Final Tamping (MTT), including trial operation	tm	1,000	34,538	133,767	
	2.2.5 Simple Turnout clearing	set	2	0	5	
	2.2.6 Simple Turnout installation	set	2	7	12	
	3.Track material replacment					
	3.1 Sleeper and trackbed replacement	m	26,646	26,646	26,646	
	3.2 Trackbed replacement	m	11,480	11,480	11,480	
	3.3 Sleeper replacement	m	59,768	59,768	59,768	
	3.4 Bridge sleeper replacement	m	403	403	403	
	3.5 Rail replacement	m	0	83,055	83,055	

5. Track works Quantity summary table-2

④ idea: The coal unloading equipment is constructed in Musi river away from Simpang at about 7km.

⑤ idea: The coal unloading equipment is constructed in Mariana away from Simpang at about 35km.

⑥ idea: The coal unloading equipment is constructed in Gasing away from Simpang at about 45km.

№	Work item	Unit	④ idea	⑤ idea	⑥ idea	Recapitulation
			Quantity	Quantity	Quantity	
	1. Procurement					
	1.1 R54 Rail	ton	1,064	5,364	4,186	
	1.2 Normal Joint Bar	set	296	624	528	
	1.3 PC Sleeper & Fastenng	set	15,762	81,036	63,097	
	1.4 Syntetic Sleeper for Joint	set	296	624	528	
	1.5 Syntetic Sleeper for Steel Bridge	set	0	1,666	1,500	
	1.6 Simple Turnout R54# 12 with Conc. Sleeper	set	3	7	5	
	2. Installation					
	2.1 Ballast delivery and spreading	m ³	19,400	95,060	73,914	
	2.2 Track Laying General, including initial tamping	tm	10,000	49,000	38,100	
	2.3 Rail Welding	no	234	1,643	1,258	
	2.4 Final Tamping (MTT), including trial operation	tm	10,000	49,000	38,100	
	2.5 Simple Turnout clearing	set	0	0	0	
	2.6 Simple Turnout installation	set	3	7	5	

6. Contents Table of Each Stage Track Work (number: extension of railway and track)

		Section A	Section B	Section C	Total	
		Lahat to Muaraenim section	Muaraenim to Prabumulih X6 section	Prabumulih X6 to Kertapati section		
The 1st Stage	1. Track rehabilitation work					
	①Track rehabilitation work (Section A and B)					
	-Sleeper and trackbed replacement	Km	0.000	3.080	3.080	
	-Trackbed replacement	Km	8.788	0.000	8.788	
	-Sleeper replacement (including bridge sleeper)	Km	0.000	0.186	0.186	
	-Final Tamping (MTT) (including trial operation)	Km	38.508	31.109	69.617	
	②Replacement of R54 and PC sleepers					
	-Sleeper and trackbed replacement	Km		23.567	23.567	
	-Trackbed replacement	Km		2.691	2.691	
	-Sleeper replacement (including bridge sleeper)	Km		59.985	59.985	
	-Rail replacement	Km		0.000	0.000	
	-Final Tamping (MTT) (including trial operation)	Km		85.859	85.859	
	2. Civil engineering structures improvement (Ballast delivery and spreading, Track Laying General (including initial Tamping) ,Final Tamping (MTT) (including trial operation)					
	①Station facility improvement (effective length extension)	No.	1	1	0	2
		Km	0.235	0.188	0.000	0.423
	②Additional signal stations work	No.	0	0	0	0
		Km	0.000	0.000	0.000	0.000

		Section A	Section B	Section C	Total	
		Lahat to Muaraenim section	Muaraenim to Prabumulih X6 section	Prabumulih X6 to Kertapati section		
The 2nd Stage	1. Track rehabilitation work					
	①Track rehabilitation work (Section A and B)					
	-Sleeper and trackbed replacement	Km	0.000	0.000		0.000
	-Trackbed replacement	Km	0.000	0.000		0.000
	-Sleeper replacement (including bridge sleeper)	Km	0.000	0.000		0.000
	-Final Tamping (MTT) (including trial operation)	Km	0.000	0.000		0.000
	②Replacement of R54 and PC sleepers					
	-Sleeper and trackbed replacement	Km			0.000	0.000
	-Trackbed replacement	Km			0.000	0.000
	-Sleeper replacement (including bridge sleeper)	Km			0.000	0.000
	-Rail replacement	Km			83.055	83.055
	-Final Tamping (MTT) (including trial operation)	Km			0.000	0.000
	2. Civil engineering structures improvement (Ballast delivery and spreading, Track Laying General (including initial Tamping), Final Tamping (MTT) (including trial operation)					
	①Station facility improvement (effective length extension)	No.	2	1	5	8
		Km	0.803	0.240	2.882	3.925
	②Additional signal stations work	No.	1	0	1	2
		Km	0.740	0.000	0.740	1.480
	3. Branch line construction between Merapi and coal storage yard (Ballast delivery and spreading, Track Laying General (including initial Tamping), Final Tamping (MTT) (including trial operation)	Km	2.110			2.110
	4. Double tracking (1) (Section B) (Ballast delivery and spreading, Track Laying General (including initial Tamping), Final Tamping (MTT) (including trial operation)	Km		27.024		27.024

		Section A	Section B	Section C	Total	
		Lahat to Muaraenim section	Muaraenim to Prabumulih X6 section	Prabumulih X6 to Kertapati section		
The 3rd Stage	I. Track rehabilitation work					
	①Track rehabilitation work (Section A and B)					
	-Sleeper and trackbed replacement	Km	0.000	0.000		0.000
	-Trackbed replacement	Km	0.000	0.000		0.000
	-Sleeper replacement (including bridge sleeper)	Km	0.000	0.000		0.000
	②Replacement of R54 and PC Sleepers					
	-Sleeper replacement (including bridge sleeper)	Km			0.000	0.000
	-Rail replacement	Km			0.000	0.000
	2. Civil engineering structures improvement (Ballast delivery and spreading, Track Laying General b(including initial Tamping), Final Tamping (MTT) (including trial operation)					
	①Station facility improvement (effective length extension)	Km	0.000	0.000	0.000	0.000
	②Additional signal stations work	k m	0.000	0.000	0.000	0.000
	3. Double tracking (2) (Section A) Ballast delivery and spreading, Track Laying General (including initial Tamping), Final Tamping (MTT) (including trial operation)	Km	25.288			25.288
	4. Double tracking (3) (Section C) Ballast delivery and spreading, Track Laying General (including initial Tamping), Final Tamping (MTT) (including trial operation)	Km			74.267	74.267

7. The rough cost of construction according to scheme scale (Track facility)

Scheme scale	Total			Existing line improvement			Effective length extension (Including double-tracking, Merapi-New line, New station, Kertapati yard)		
	Installation and replacement	Procurement	Total (100 million Yen)	Installation and replacement	Procurement	Total (100 million Yen)	Installation and replacement	Procurement	Total (100 million Yen)
1st stage	Foreign currency (Rp)	0	4,555,987,894	0	3,595,601,900	3,595,601,900	0	960,385,994	960,385,994
	Domestic (Rp)	92,702,466,188	238,983,335,852	91,995,272,260	145,556,032,552	237,551,304,812	707,193,928	724,837,111	1,432,031,040
	Total (Rp)	92,702,466,188	243,539,323,746	91,995,272,260	149,151,634,452	241,146,906,712	707,193,928	1,685,223,105	2,392,417,034
2nd stage (Accumulation)	Foreign currency (Rp)	5,317,033,568	272,764,745,635	0	195,500,908,837	195,500,908,837	5,317,033,568	77,263,836,798	82,580,870,366
	Domestic (Rp)	155,198,685,708	213,157,637,045	104,759,790,007	151,775,431,778	256,535,221,784	50,438,895,701	61,382,205,268	111,821,100,969
	Total (Rp)	160,515,719,276	485,922,382,680	104,759,790,007	347,276,340,615	452,036,130,621	55,755,929,269	138,646,042,066	194,401,971,335
3rd stage (Accumulation)	Foreign currency (Rp)	10,605,548,668	465,496,228,045	0	195,500,908,837	195,500,908,837	10,605,548,668	269,995,319,208	280,600,867,876
	Domestic (Rp)	296,672,486,682	382,061,507,696	104,759,790,007	151,775,431,778	256,535,221,784	191,912,696,675	230,286,075,918	422,198,772,593
	Total (Rp)	307,278,035,350	847,557,735,740	104,759,790,007	347,276,340,615	452,036,130,621	202,518,245,343	500,281,395,126	702,799,640,469

8. The rough cost of construction of a coal unroad equipment route proposal (Track facility)

Construction proposal	Installation	Procurement	Total (100 million Yen)
Simpang-Musi (7km)	Foreign currency (Rp)	335,006,100	22,874,582,698
	Domestic (Rp)	13,805,680,143	30,726,567,603
	Total (Rp)	14,140,686,243	53,601,150,301
Simpang-Gasing (45km)	Foreign currency (Rp)	2,352,487,280	112,944,734,712
	Domestic (Rp)	67,868,796,053	152,802,817,840
	Total (Rp)	70,221,283,333	265,747,552,551
Simpang-Maliana (35km)	Foreign currency (Rp)	1,800,443,040	88,976,511,325
	Domestic (Rp)	52,750,702,607	118,957,501,324
	Total (Rp)	54,551,145,647	207,934,012,649

10. Distribution of a rough cost of construction [The 2nd step]
KERTAPATI - PRABUMULIH RAILWAY LINE

(Track facility)

Station name	Station mark	Distance expressed in kilometers	Track material replacement						Installation										Procurement						Note		
			Extension on of a steel bridge (m)	Extension of a steel bridge (m)	Station spacing (m)	3.1 Sleeper and trackbed replacement (m)	3.2 Trackbed replacement (m)	3.3 Sleeper replacement (m)	3.4 Bridge sleeper replacement (m)	3.5 Rail replacement (m)	2.1 extension (m)	2.2 Ballast delivery and spreading (m ³)	2.3 Track Laying (m)	2.4 Rail Welding (no)	2.5 Final Tamping (M/T)	2.6 Simple Turnout clearance (set)	1.1 R54 Rail (ton)	1.2 Normal Joint Bar (set)	1.3 PC Steeper & Fastening (set)	1.4 Synthetic Steeper for Joint (set)	1.5 Synthetic Steeper for Steel Bridge (set)	1.6 Simple Turnout R54# 17 (set)					
KERTAPATI	KPT	400+102	1,405	1,375	0	0	0	0	1,375	1,405	0	0	0	0	1,375	0	149	110	2,200	110	110	0	0	0	4	New installation (700m+700m+2)	
2nd stage			2,205	2,205	0	0	0	0	2,205	5,160	2,205	0	0	0	2,205	4	238	176	3,520	176	176	0	0	0	0	ballast replacement all line sections	
SIMPANG	SIG	388+500	776	746	0	0	0	0	746	776	0	0	0	0	746	0	81	59	1,160	59	59	0	0	0	0	ballast replacement all line sections	
2nd stage			776	776	0	0	0	0	776	776	0	0	0	0	776	0	0	0	0	0	0	0	0	0	0	2 effective length with no change	
PAYAKABUNG	PYK	373+335	88	10,018	0	0	0	0	5,000	15,078	0	0	0	0	5,000	0	1,631	171	25,170	171	171	0	0	0	0	ballast replacement SIG-378k	
2nd stage			770	770	0	0	0	0	563	770	402	207	0	0	563	2	58	42	840	42	42	0	0	0	0	2 effective length 700m	
SERDANG	SDN	363+479	770	9,856	0	493	9,796	0	9,796	9,856	0	0	0	0	9,796	0	1,058	114	16,045	114	114	0	0	0	0	ballast replacement 5%	
2nd stage			770	770	0	0	0	0	740	770	0	0	0	0	740	0	80	59	1,160	59	59	0	0	0	0	ballast replacement 5%	
GLUMBANG	GLB	353+822	770	770	0	0	0	0	9,582	9,642	0	0	0	0	9,582	0	1,036	131	15,860	131	131	25	0	0	0	2 effective length with no change	
2nd stage			770	770	0	0	0	0	770	770	0	0	0	0	770	0	80	59	1,160	59	59	0	0	0	0	ballast replacement 5%	
KARANGENDAH	KED	345+594	531	8,228	0	411	8,168	0	8,168	8,228	0	0	0	0	8,168	0	882	123	13,686	123	123	0	0	0	0	ballast replacement 5%	
2nd stage			770	770	0	0	0	0	501	531	464	239	0	0	501	0	54	40	800	40	40	0	0	0	0	ballast replacement 5%	
LEMBAK	LEB	338+188	731	731	0	0	0	0	731	731	0	0	0	0	731	0	76	56	1,120	56	56	0	0	0	0	ballast replacement 5%	
2nd stage			770	770	0	0	0	0	701	770	76	39	0	0	701	0	4	3	40	3	3	0	0	0	0	2 effective length 700m	
New Station(I)	NEWJ	330+688	0	15,893	0	795	15,833	0	15,833	15,893	0	0	0	0	15,833	0	1,710	176	26,360	176	176	0	0	0	0	ballast replacement 5%	
2nd stage			770	770	0	0	0	0	770	770	0	0	0	0	770	0	---	---	---	---	---	---	---	---	---	---	Signal station new installation
PRABUMULIH	PBM	322+295	578	578	0	0	0	0	548	578	0	0	0	0	548	0	59	43	840	43	43	0	0	0	0	ballast replacement 5%	
2nd stage			770	770	0	0	0	0	770	770	372	192	0	0	770	2	31	15	280	15	15	0	0	0	0	2 effective length 700m	
Sub total I			77,807	217	92,086	23,567	2,351	39,488	83,055	92,086	7,909	3,622	2,611	86,677	16	9,384	1,757	143,676	1,757	1,757	360	20	20	20			

12. The rough cost of construction of a coal unroad equipment route proposal (Track facility)

Simpang-Maliana (35km)

Station name	mark	Distance expressed in kilometers	Station spacing (m)	Extension of a steel bridge (m)	Extension of a ballast track (m)	Installation										Procurement					Note
						2.1	2.2	2.3	2.4	2.5	2.6	1.1	1.2	1.3	1.4	1.5	1.6				
			(m)	(m)	(m)	Ballast delivery and spreading (m3)	Track Laying (tm)	Rail Welding (no)	Final Tamping (MTT)	Simple Turnout clearance (set)	Simple Turnout installation (set)	R54 Rail (ton)	Normal Joint Bar (set)	PC Sleeper & Fastening (set)	Synthetic Sleeper for Joint (set)	Synthetic Sleeper for Steel Bridge (set)	Simple Turnout R54# 12 with Conc. Sleeper (set)				
SIMPANG	SIG	000+000	12,500	600	11,900	23,086	11,900	411	11,900	0	0	1,344	88	18,898	88	1,000	1				
station		012+500	22,500	300	22,200	1,940	1,000	32	1,000	0	2	105	16	1,605	16	500	2				
(MARIANA)		035+000			3,000	5,820	3,000	0	3,000	0	2	314	240	5,000	240		2				
Total			35,000	900	38,100	73,914	38,100	1,238	38,100	0	5	4,186	528	63,097	528	1,500	5				

unit price 1 (Yen)	Import	0	0	13,015	0	0	0	0	0	0	0	155,871	0	0	48,787	48,787	8,216,240
unit price 2 (Rp)	Local	341,796	540,324	687,955	156,360	5,224,030	5,224,030	15,672,091	1,953,189	1,013,517	28,426	1,953,189	1,013,517	5,394,996	5,394,996	28,426	35,870,583
Total unit price (Rp)	unit price 1+2	341,796	540,324	2,119,605	156,360	5,224,030	5,224,030	15,672,091	1,953,189	1,013,517	28,426	1,953,189	1,013,517	5,394,996	5,394,996	28,426	939,656,983
Import(Yen)	unit price 1 × ①	808,877,376										652,488,476	0	0	25,759,536	73,180,500	41,081,200
Local(Rp)	unit price 2 × ②	118,957,501,324										988,909,772	63,909,544,310	15,008,928	42,630,000	42,630,000	179,352,915
Import+Local(RP)		207,934,012,649										72,762,762,097	1,011,283,792	2,848,557,888	8,092,094,000	8,092,094,000	4,698,284,915

Note The number of intermediate stations was made into one place, and sidetrack extension was assumed to 1,000m.
 The track total extension of a terminal station was assumed to 3,000m.
 Extension of a non-ballast bridge was assumed to 900m.

[Appendix 5-4-5] Signal and Telecommunication Facilities and Electromechanical Facilities

1. Total Work Cost of Signal and Telecom Facilities and Electromechanical Facilities

			Work cost (unit: million Rp.)			Remarks
			Foreign cost	Local cost	Total	
Signal and telecom facilities	The 1st stage	single	13,706	1,164	14,870	
		total	13,706	1,164	14,870	
	The 2nd stage	single	64,752	34,308	99,060	
		total	78,458	35,472	113,930	
	The 3rd stage	single	815,406	631,854	1,447,260	
		total	893,864	667,326	1,561,190	
Electromechanical facilities	The 1st stage	single	0	0	0	
		total	0	0	0	
	The 2nd stage	single	1,596	13,989	15,585	
		total	1,596	13,989	15,585	
	The 3rd stage	single	10,314	3,656	13,970	
		total	11,910	17,645	29,555	

2. Signalling and Telecommunication Facilities

No.	Description	Unit	Unit Cost (Rp)	Initial Stage		Transition Stage		Final Stage	
				Quantity	Amount (Rp)	Quantity	Amount (Rp)	Quantity	Amount (Rp)
	Signalling Facilities								
1	Mechanical Signal system								
1.1	Signal, Indicator and Marker	set	200,500,000	24	4,812,000,000	177	35,488,500,000	177	35,488,500,000
1.2	Point Machines & Mechanisms	set	386,860,000	26	10,058,360,000	141	54,547,260,000	141	54,547,260,000
2	Electronical Signal system								
2.1	Interlocking System	set	9,800,000,000	0	0	0	0	27	264,600,000,000
2.2	Signal, Indicator and Marker	set	254,655,000	0	0	0	0	410	104,408,550,000
2.3	Point Machines	set	335,000,000	0	0	0	0	173	57,955,000,000
2.4	Track Circuits	set	980,000,000	0	0	0	0	215	210,700,000,000
2.5	Level Crossing Protection	set	2,110,000,000	0	0	0	0	50	105,500,000,000
2.6	Centralized Traffic Control system (CTC)	set	8,850,000,000	0	0	0	0	8	70,800,000,000
2.7	External Cable	set	1,247,800,000	0	0	0	0	233	290,737,400,000
2.8	Automatic Traffic System (ATS)	set	660,000,000	0	0	12	7,920,000,000	200	132,000,000,000
3	Mechanical Signal Equipment								
3.1	Removable of Mechanical Interlocking Power Supply	set	900,000	0	0	0	0	30	27,000,000
3.2	Removable of Signal, Indicator and Marker	set	1,052,000	0	0	0	0	373	392,396,000
3.3	Removable of Point Machines & Mechanisms	set	450,000	0	0	0	0	113	50,850,000
4	Spare Part for Signalling accessories	set	720,000,000	0	0	0	0	1	720,000,000
5	Test & Commissioning	set	123,000,000	0	0	1	123,000,000	2	246,000,000
6	Training	set	100,000,000	0	0	0	0	1	100,000,000
7	Modification of Existing Signalling Equipment	set	151,000,000	0	0	1	151,000,000	2	302,000,000
8	Services	set	132,000,000	0	0	1	132,000,000	2	264,000,000
9	Signal Equipment Room	set	667,000,000	0	0	11	7,337,000,000	38	25,346,000,000
	Telecommunication Facilities								
10	Telecommunication system								
10.1	Telecommunication	set	1,855,000,000	0	0	1	1,855,000,000	50	92,750,000,000
10.2	Telecommunication Cable	set	459,285,000	0	0	13	5,970,705,000	247	113,443,395,000
10.3	Test & Commissioning	set	123,000,000	0	0	1	123,000,000	2	246,000,000
10.4	Modification of Existing Telecommunication Equipment	set	151,000,000	0	0	1	151,000,000	2	302,000,000
10.5	Services	set	132,000,000	0	0	1	132,000,000	2	264,000,000
	Total	set			14,870,360,000		113,930,465,000		1,561,190,351,000

3. Electrification and Other Facilities (AFC)

No.	Description	Unit	Unit Cost (RP)	Initial Stage		Transition Stage		Final Stage	
				Quantity	Amount (RP)	Quantity	Amount (RP)	Quantity	Amount (RP)
1	Power Supply Facilities								
1.1	Power Supply system	set	5,059,500,000	0	0	3	15,178,500,000	5	25,297,500,000
1.2	Test & Commissioning	set	123,000,000	0	0	1	123,000,000	2	246,000,000
1.3	Modification of Existing Power Supply Equipment	set	151,000,000	0	0	1	151,000,000	2	302,000,000
1.4	Services	set	132,000,000	0	0	1	132,000,000	2	264,000,000
2	Other Facilities (AFC) Facilities								
2.1	Automatic Fare Collection system	set	607,880,000	0	0	0	0	5	3,039,400,000
2.2	Test & Commissioning	set	123,000,000	0	0	0	0	1	123,000,000
2.3	Modification of Existing Other Facilities (AFC) Equipment	set	151,000,000	0	0	0	0	1	151,000,000
2.4	Services	set	132,000,000	0	0	0	0	1	132,000,000
	Total	set			0		15,584,500,000		29,554,900,000

4. Signal and Telecomfacilities Unit-price Table

No	Work item	Unit	Unit price (Rp)	Recapitulation
	Signalling & Telecommunication Facilities			
1.0	Mechanical Signal Equipment			
1.1	Signal, Indicator and Marker	Set	200,500,000	
1.2	Point Machines & Mechanisms	Set	386,860,000	
2.0	Electrical Signal Equipment			
2.1	Interlocking System	Set	9,800,000,000	
2.2	Signal, Indicator and Marker	Set	254,655,000	
2.3	Point Machines	Set	335,000,000	
2.4	Track Circuits	Set	980,000,000	
2.5	Level Crossing Protection	Set	2,110,000,000	
2.6	Centralized Traffic Contral system	Set	8,850,000,000	
2.7	External Cable	Set	1,247,800,000	
2.8	Automatic Traffic System (ATS)	Set	660,000,000	
3.0	Mechanical Signal Equipment			
3.1	Removable of Mechanical Interlocking Power Supply	Set	900,000	
3.2	Removable of Signal,indicator and Marker	Set	1,052,000	
3.3	Removable of Point Machines & Mechanisms	Set	450,000	
4.0	Spare Part for Signalling accessories	Set	720,000,000	
5.0	Test & Commissioning	Set	123,000,000	
6.0	Training	Set	100,000,000	
7.0	Modification of Exsisting Signalling Equipment	Set	151,000,000	
8.0	Service	Set	132,000,000	
9.0	Signal & Communication house	Set	667,000,000	
	Telecommunication Equipment			
10.0	Telecommunication system			
10.1	Telecommunication	Set	1,855,000,000	
10.2	Telecommunication Cable	Set	459,285,000	
10.3	Test & Commissioning	Set	123,000,000	
10.4	Modification of Exsisting Telecommunication Equipment	Set	151,000,000	
10.5	Service	Set	132,000,000	

5. Signal and telecommfacilities quantity summary table

The first stage(Single track improvement,Target transportation amount 2.5 million ton/year,395m in train organization length)

The second stage (Target transportation amount five million ton/year,615m in train organization length)

The third stage (Complete double-track line making,930m in train organization length during target transportation amount 20 million ton/year)

№	Work item	Unit	The first stage	The second stage	The third stage	Recapitulation
			Quantity	Quantity	Quantity	
	Signalling & Telecommunication Facilities					
1.0	Mechanical Signal Equipment	set				
1.1	Signal, indicator, Marker	set	24	177	177	
1.2	Interlocking System	set	26	141	141	
2.0	Electrical Signal Equipment					
2.1	Interlocking System	set	0	0	27	
2.2	Signal, indicator, Marker	set	0	0	410	
2.3	Point Machines	set	0	0	173	
2.4	Track Circuits	set	0	0	215	
2.5	Level Crosssoing Protection	set	0	0	50	
2.6	Centralized Traffic Contral	set	0	0	8	
2.7	External Cable	set	0	0	233	
2.8	Automatic Traffic System	set	0	12	200	
3.0	Mechanical Equipment					
3.1	Removable of Mechanical Electrical system	set	0	0	30	
3.2	Removable of Signal, indicator, Marker	set	0	0	373	
3.3	Removable of Point Machines	set	0	0	11	
4.0	Spare Parts for Signal	set	0	0	1	
5.0	Test & Commissioning	set	0	1	2	
6.0	Training	set	0	0	1	
7.0	Modification of Exsisting Signalling Equipment	set	0	1	2	
8.0	Service	set	0	1	2	
9.0	Signal & Communication house	set	0	11	38	
	Telecommunication Equipment					
10.0	Telecommunication system					
10.1	Telephone system	set	0	1	50	
10.2	Telecommunication Cable	set	0	13	247	
10.3	Test & Commissioning	set	0	1	2	
10.4	Modification of Exsisting Telecommunication Equipment	set	0	1	2	
10.5	Service	set	0	1	2	

6. Electromechanical facilities unit price table

No	Work item	Unit	Unit price (Rp)	Recapitulation
1.0	Electrification equipment			
1.1	Power Supply	set	5,059,500,000	
1.2	Test & Commissioning	set	123,000,000	
1.3	Modification of Existing Electrification Equipment	set	151,000,000	
1.4	Services	set	132,000,000	
2.0	Other Facilities (AFC)			
2.1	Automatic Fare Collection system	set	607,880,000	
2.2	Test & Commissioning	set	123,000,000	
2.3	Modification of Existing Automatic Fare Collection system	set	151,000,000	
2.4	Services	set	132,000,000	

7. Electromechanical Facilities Quantity Summary Table

The first stage(Single track improvement,Target transportation amount 2.5 million ton/year,395m in train organization length)

The second stage (Target transportation amount five million ton/year,615m in train organization length)

The third stage (Complete double-track line making,930m in train organization length during target transportation amount 20 million ton/year)

№	Work item	Unit	The first stage	The second stage	The third stage	Recapitulation
			Quantity	Quantity	Quantity	
1	Electrification equipment					
1.1	Power Supply	set	0	3	5	
1.2	Test & Commissioning	set	0	1	2	
1.3	Modification of Existing Electrification Equipment	set	0	1	2	
1.4	Services	set	0	1	2	
2	Mechanical equipment					
2.1	Automatic Fare Collection system	set	0	0	5	
2.2	Test & Commissioning	set	0	0	1	
2.3	Modification of Existing Automatic Fare Collection system	set	0	0	1	
2.4	Services	set	0	0	1	

[Appendix 5-4-6] List of Rolling Stock, Loading and Unloading Equipment

Target transportation amount : 250million ton per year

		(rolling stock number)			(million yen)	
	Main line	Branch line	Spare	Total	Unit	Total
Locomotives (CC205)	8	2	1	11	305	3,355
Wagons (Flat Wagon)	200	0	10	210	6	1,260
(Locomotives 1 + Wagons 25) × 8 coming and going per day					Rolling stock costs total	4,615

Length of Train Set: L=395m

One set of rolling stock repair apparatus	Spare parts (2years) Special tools Test equipment	451
---	---	------------

Loading and unloading facilities reinforcement	Loading facilities (Sukancinta) : Sovel loader, 1 set Unloading facilities (Container yard) : Reach stacker, 2 set Unloading facilities (Stock yard) : Belt conveyor, 1 set	134
--	---	------------

Target transportation amount : 500million ton per year

		(rolling stock number)			(million yen)	
	Main line	Branch line	Spare	Total	Unit	Total
Locomotives (CC205)	13	1	1	15	305	4,575
Wagons (Flat Wagon)	400	0	20	420	6	2,520
(Locomotives 2 + Wagons 40) × 10 coming and going per day					Rolling stock costs total	7,095

Length of Train Set: L=615m

One set of rolling stock repair apparatus	Spare parts (2years) Special tools Test equipment	677
---	---	------------

Loading and unloading facilities reinforcement	Loading facilities (Sukancinta) : Sovel loader, 1 set Loading facilities (Merapi) : Belt conveyor, 1 set Unloading facilities (Container yard) : Reach stacker, 3 set Unloading facilities (Stock yard) : Belt conveyor, 2 set	356
--	---	------------

Target transportation amount : 2000million ton per year

		(rolling stock number)			(million yen)	
	Main line	Branch line	Spare	Total	Unit	Total
Locomotives (CC205)	27	6	3	36	305	10,980
Wagons (50t Wagon)	840	0	20	860	8	6,880
(Locomotives 3 + Wagons 60) × 21 coming and going per day					Rolling stock costs total	17,860

Length of Train Set: L=930m

One set of rolling stock repair apparatus	Spare parts (2years) Special tools Test equipment	1,016
---	---	--------------

Loading and unloading facilities reinforcement	Loading facilities (Sukancinta) : Sovel loader, 2 set Loading facilities (Merapi) : Belt conveyor, 4 set Unloading facilities (Container yard) : Reach stacker, 6 set Unloading facilities (Stock yard) : Belt conveyor, 4 set Unloading facilities (New stock yard) : Belt conveyor, 6 set	1,672
--	---	--------------

[Appendix 5-4-7] Cost of Coal Loading and Unloading Facilities

<The 1st Stage>

Stockyard in Sukacinta Station (The 1st Stage)

Facility	Unit Price (JPY)	Q'ty	Delivery	Total (JPY)
Wheel loader	22,000,000	1	4 months	22,000,000
Grand Total				22,000,000

Kertapati Station (The 1st Stage)

Facility	Unit Price (JPY)	Q'ty	Delivery	Total (JPY)
Self-propelled Oscillation Belt Conveyer	80,000,000	1	15 months	80,000,000
Reach Stacker	32,000,000	1	10 months	32,000,000
Grand Total				112,000,000

(Source: Study team)

<The 2nd Stage>

Merapi Stockyard (The 2nd Stage)

Facility	Unit Price (JPY)	Q'ty	Delivery	Total (JPY)
Belt Conveyer	88,000,000	1	6 months	88,000,000
Grand Total				88,000,000

Kertapati Station (The 2nd Stage)

Facility	Unit Price (JPY)	Q'ty	Delivery	Total (JPY)
Self-propelled Oscillation Belt Conveyer	70,000,000	1	15 months	70,000,000
Reach Stacker	32,000,000	2	10 months	64,000,000
Grand Total				134,000,000

(Source: Study team)

<The 3rd Stage>

Merapi Stockyard (The 3rd Stage)

Facility	Unit Price (JPY)	Q'ty	Delivery	Total (JPY)
Belt Conveyer	88,000,000	3	6 months	264,000,000
Wheel loader	22,000,000	1	4 months	22,000,000
Grand Total				286,000,000

Kertapati Station (The 3rd Stage)

Facility	Unit Price (JPY)	Q'ty	Delivery	Total (JPY)
Belt Conveyer	115,000,000	3	15 months	690,000,000
Self-propelled Oscillation Belt Conveyer	122,000,000	2	15 months	244,000,000
Reach Stacker	32,000,000	3	10 months	96,000,000
Grand Total				1,030,000,000

(Source: Study team)

<The Long-term Plan for Reference>

Mariana Station (The Reference Stage)

Facility	Unit Price (JPY)	Q'ty	Delivery	Total (JPY)
Belt Conveyer	28,000,000	2	6 months	56,000,000
Grand Total				56,000,000

(Source: Study team)

Consulting Services
for
Capacity Expansion Project of Railway Line between
Lahat - Kertapati in South Sumatra

Terms of Reference (TOR)

1. Introduction

Coal is one of the strategic commodities for Indonesian economy and natural resource policy formulation in terms of export as well as fuel for domestic electric power generation, thus the coal mine has been actively developed. Consequently, the coal output has been expanded 4 folds in the past 10 years and Indonesia is in the 7th place among coal producing countries. Particularly for the general use coal category, the Indonesian export is in the world top place surpassing Australia. Sumatra is the 2nd biggest coal production site after Kalimantan in Indonesia and the potential deposit of price competitive sub-bituminous coal in Kalimantan is huge of which the demand is growing. Furthermore, Sumatra coal demand is even big thanks to its geographical advantage in South-east Asia. However the production increase is restrained due to land transportation capacity shortage and loading/ unloading facility bottleneck in its forwarder ports.

There are choices of road and rail as land transportation of coal traveling to Kertapati port, but the road capacity is already saturated and alternative mode of transportation is urgently needed. However the railway is single track with no electrification of which the transportation capacity is only 1.9 MTPA. PT.KAI has a plan to expand the line capacity to cope with the growing demand, but the planned target capacity of line to Kertapati is only 2.7 MTPA (Million Ton Per Annum) which is far short of projected demand. Therefore capacity expansion of railway line to Kertapati is the urgent necessity for the coal production expansion.

2. Background

The feasibility study of the project was carried out sponsored by JICA (Japan International Cooperation Agency) in an effort to promote PPP (Public Private Partnership) projects in Indonesia. It has been confirmed in the study that there are high demands to transport coal by railway especially from Lahat to Kertapati, and it is an urgent necessity to promptly increase the transport capacity in this line because there are various private coal mines in this area expecting to use the railway.

Based on the feasibility study, considering the urgent necessity of the coal transportation capacity expansion, the project was divided into three (3) stages so that the transportation capacity shall be increased in step-by-step manner at the completion of each stage. The major works of the 3 stages are as follows.

- 1st stage: Rehabilitation of the existing line with the transportation capacity target of 2.5 MTPA increase.
- 2nd stage: Partial double tracking work with the transportation capacity target of 5.0 MTPA increase.
- 3rd stage: Whole double tracking work with the transportation capacity target of over 10.0 MTPA increase.

In addition to the railway infrastructure expansion works mentioned above, procurement of train sets (locomotive and freight wagon) and commissioning work and procurement of coal loading and unloading facilities and installation work are included in the project.

The feasibility Study recommends that the implementing agency shall differ at each stage of implementation depending on the financing scheme of the project. The implementing agency of the 1st stage is proposed to be a private investor having financial assistance by JICA, while the 2nd and the 3rd are the public sector having financial assistance by JICA too. Here, the private investor must be appointed in the first place through tender process. The tender must be fairly conducted by the public sector in accordance with the law and regulations of Indonesia as long as it doesn't contradict against the JICA regulation. Therefore, the tender process must be controlled by the public sector in the PPP scheme framework with the assistance of consultant familiar with the procedure.

However, it should be noted that this TOR is prepared on a premise that entire project including the 1st stage, the 2nd stage and the 3rd stage is implemented by the public sector having financial assistance by JICA. Therefore, this TOR should be split into parts in the actual application depending on the project formation. For example, in the 1st stage, private investor selection assistance should be the responsibility of the public sector, while the procurement of goods and works, construction supervision and the commissioning of facilities are the

responsibility of the private sector who won the tender, according to the proposal made by the feasibility study for the 1st stage implementation. Another example is the case where the railway infrastructure building component is born by the public sector having JICA financial assistance, of which the feasibility study is proposing for the 2nd and the 3rd stage project implementation.

For the smooth implementation of the Project, the consulting services shall be executed by a qualified consulting company (the Consultant) who has extensive international experience of railway transport planning, mass rapid transit system engineering and railway development and construction management services in developing countries with similar conditions to Indonesia.

3. Objectives

The overall objectives of this consulting engineering service are to develop basic engineering design, to prepare bid documents for the project, and to coordinate with agencies concerned in assisting the implementing agency. To implement this project efficiently, employment of the consultant is vital because the implementing agency under the PPP scheme is not necessarily familiar with the procurement and construction works as well as JICA guidelines. The purpose of consulting engineering service is to provide expertise in the field of railway engineering to implement the project safely and economically, and to support the implementing agency in the face of technical judgments in the process of detailed design and preparing tender documents.

4. Scope of Services

The procurement of goods and works shall be in accordance with "Guidelines for Procurement under Japanese ODA Loans (September, 2009)". The TOR (Terms of Reference) of the Consultant to be employed in the Project is expected to be as follows.

4.1. Social and Environmental Clearance

Based on the AMDAL and the LARAP reports drafted during the feasibility study, following documents shall be prepared by the Consultant.

- 1) Finalized AMDAL backed up by stake holders meeting
- 2) Finalized LARAP backed up by stake holders meeting

4.2. Basic Design

Following documents shall be prepared by the Consultant.

- 1) Design criteria and standard
- 2) Basic design drawings and bill of quantities

4.3. Detail Design

Following documents shall be prepared by the Consultant.

- 1) Technical Report
- 2) Detail design drawings and bill of quantities

4.4. Preparation of Bidding Document for the Civil Work and Facility Procurement

Following documents shall be prepared by the Consultant.

- 1) Qualification documents and condition of contract
- 2) Form of tender

4.5. Assistance to the Procurement Procedure

- 1) Materials specifications
- 2) Contract Documents

4.6. Construction Supervision

The Consultant shall attend and inspect at the commissioning of civil works, track works and other works of construction and check whether their performances comply with Indonesian railway law, environment law and technical specification.

4.7. Commissioning of Rolling-stock and Various System of Equipments

The Consultant shall attend and inspect at the commissioning of rolling stock and other systems of equipment procured by the private investor and check whether their performances comply with Indonesian railway law and environment law.

4.8. Assistance to the Selection of SPC Concession

Following documents shall be prepared by the Consultant for selection of SPC (Special Purpose Company) to be established by the private investment.

- 1) Conditions of Operation Management of SPC
- 2) Preparation of Tender Documents for selection of SPC
- 3) Evaluation criteria for Tender Documents
- 4) Draft of SPC Concession Agreement

5. Deliverables

Deliverables from this engineering service are:

- a. Basic design: Technical Report, drawing and technical specification.
- b. Guidelines for construction: Design criteria and standard, procedure and schedule and construction method.

Table 2 The Manning Schedule for the Consulting Services

No.	Assignment	Pro A	Pro B	SS
A01	Project Manager	120		
B01	Deputy Project Manager		120	
A02	Chief Contract Specialist	15		
B02	Contract Administration Engineer		15	
A03	Cost Estimate Expert	6		
B03	Quantity Survey Engineer		6	
A04	Safety Control Expert	48		
B04	Safety Control Engineer		96	
A05	Quality Control Expert	6		
B05	Quality Control Engineer		6	
A06	Alignment Specialist	10		
B06	Alignment Engineer		20	
A07	Environment Expert	10		
B07	Environment Engineer		20	
A08	Resettlement Expert	6		
B08	Resettlement Engineer		6	
B09	Geotechnical Engineer		6	
B10	Surveyor		6	
B11	Traffic Management Engineer		40	
A09	Operation Planning Specialist	40		
B12	Train Operation Engineer		40	
A10	Locomotive Expert	40		
B13	Rolling Stock Engineer		40	
B14	Depot Engineer		40	
B15	Workshop Engineer		40	
A11	Chief Civil Engineer	40		
A12	Steel Structure Expert	40		
B16	Civil Engineer 1		40	
A13	RC Structural Expert	40		
B17	Civil Engineer 2			
B18	Soil Engineer			
A14	Track Facility Expert	40		
B19	Track Engineer		40	
A15	Chief Architect	40		
B20	Facility Engineer		40	
A16	Power System Expert	40		
B21	Power System Engineer		40	
A17	Signal System Expert	40		
B22	Signal Engineer		40	
A18	Telecom System Expert	40		
B23	Telecom Engineer		40	
A19	Utility System Expert	40		
B24	Utility Facility Engineer		40	
S01	Computer Administrator			80
S02	CAD Operator			120
S03	Office Manager			120
S04	Executive Secretary			40
S05	Secretary			80
S06	Typist			80
S07	Office Boy			120
	Total M/M Professional-A	436		
	Total M/M Professional-B		773	
	Total M/M Supporting Staff			626

8. Difference in Opinion

In the case of a difference of opinion between the Employer and the Consultants on any important matters involving professional judgment that might affect the proper evaluation or execution of the project, the Employer shall allow the Consultants to submit promptly to the Employer a written report and, simultaneously, to submit a copy to JICA. The Employer shall forward the report to JICA with its comments in time to allow JICA to study it and communicate with the Employer before any irreversible steps are taken in the matter. In cases of urgency, the Consultants have the right to request the Employer and/or JICA that the matter be discussed immediately between the Employer and JICA.

9. Budget

Funding for engineering service will be made from JICA loan either through Public sector or Private sector as it was discussed in “2. Background”.

[Appendix 6-2-1] Sample of Maintenance Plan Table for 2010



PT. KERETA API (PERSERO)

RENCANA KEGIATAN PEMELIHARAAN TAHUN 2010

DAOP : PT. KERETA API (PERSERO)

NO	OBJECT	KERUSAKAN	PERBAIKAN	SAT	VOLUME				
					RUSAK	IDEAL	K3TN		
1	REI	Cacat / defect	Ganti di btl kayu	m	35.095	54.778	31.915	18.919	
			Ganti di btl beton	m	8.769	37.479	17.411	10.693	
			Popok	titik	1.949	17.697	13.162	9.793	
			Las	titik	2.563	7.683	4.303	2.861	
		AUS	Ganti di btl kayu	m	94.850	63.467	32.791	30.000	
			Ganti di btl beton	m	28.052	73.043	42.226	26.737	
			Putus	Las	titik	769	3.158	2.744	1.576
				Ganti di btl kayu	m	8.446	4.431	2.950	2.242
				Ganti di btl beton	m	3.173	7.500	6.216	3.039
		Las	titik	1.995	7.265	4.103	2.619		
REI GONGSOL/GUIDE RAIL		Sambungan	dirawat	bh	25.717	22.817	18.584	15.804	
		a. Bantuk Kendor	pengencangan	bh	46.510	47.066	23.782	14.069	
		b. Sambungan	dirawat	bh	1.349	1.451	868	541	
		c. Kaki gongsol rusak	diganti	m ³	6.079	6.079	3.647	2.128	
		d. Rel gongsol rusak	diganti	m ³	20.548	20.548	12.329	7.192	
		c. rel pengganti jembatan	diganti	m ³	1.444	1.739	1.450	1.074	
2	BANTALAN								
BETON	KAYU	a. Bata	Putus / pecah	btg	26.525	46.445	24.920	19.593	
			Lapuk / putus	btg	211.471	243.947	91.495	63.670	
BESI	ALAT PENAMBAT	b. Wesi	Lapuk / putus	btg	10.694	12.751	6.800	4.966	
BETON/KAYU/BESI	ALAT PENAMBAT	c. Kambatan	Bengkok	btg	21.337	21.337	7.729	5.926	
			tidak siku/spasi rusak	btg	7.652	11.298	8.403	4.478	
			tarpon lembor	m ³	67.054	82.717	56.277	39.120	
			tarpon rusak/hilang	btg	544.062	788.729	229.822	156.766	
			elastis rusak/hilang	btg	163.494	428.968	112.470	82.111	
			Baut sandik rusak/hil	btg	5.847	12.035	10.922	10.369	
3	BAJAS	KRICAK	Meris	m	177.479	199.966	101.946	60.372	
			Tambah bales	m ³	110.263	133.048	76.281	42.532	
			Tambah bales	m ³	484.043	603.514	337.809	242.705	
	PASIR								
			Tambah pasir	m ³	28.384	32.290	10.675	8.876	

(Source: PT. KAI)

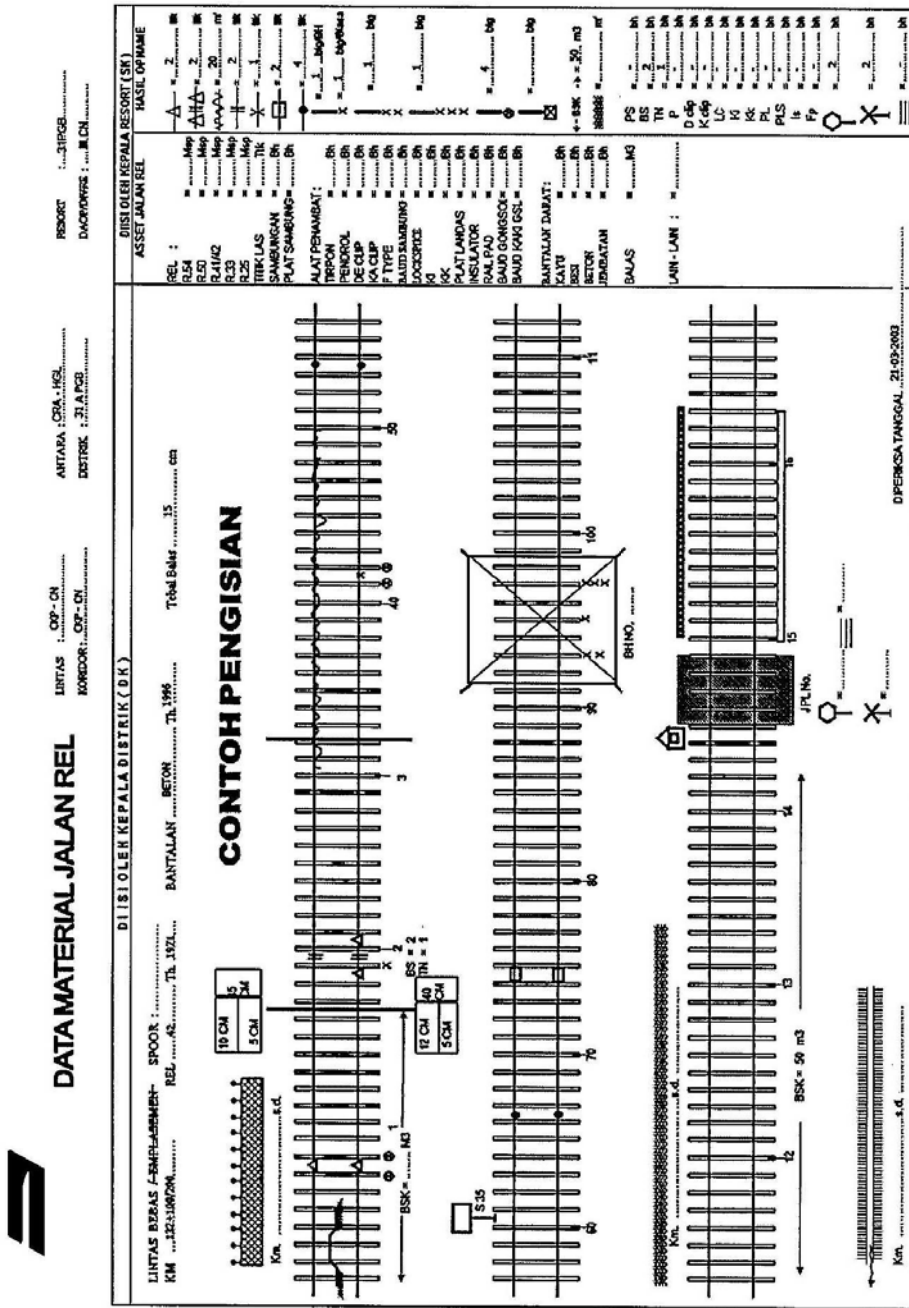
RENCANA KEGIATAN PEMELIHARAAN TH. 2010

DAOP : PT. KERETA API (Persero)

NO	OBJECT	KERUSAKAN	PERBAIKAN TOTAL		TOTAL PERBAIKAN			
			URAIAN	Ideal	Biaya	Keselamatan	Biaya	
1	KLS. I JEM. BAJA	Baja (Usul Ganti.)	18.911 ton		18.911	244.034.333	2.157	27.834.702
		Ganti. Jemb.baja			0	0	0	0
		Ganti. Jemb.beton			0	0	0	0
		Ganti Box Culvert			0	0	0	0
		Baja	22.556 ton		23	1.274.291.183	0	0
		PS	1.172 kg		1.1720	110.020.245	0,012	1.126.487
		Plat tutup	20 lbr		20	17.940.000	20	17.940.000
		Andas baja	86 bh		86	232.352.822	64	172.913.728
		Andas beton	51 bh		51	42.099.506	27	22.287.974
		Cat :						
		- K3	59 unit		59	0	59	0
		- Touch up	624 m2		624	0	600	0
		- Konserv	6.546 m2		6.546	172.748.940	6.546	172.748.940
		- Lengkap	53.552 m2		53.552	3.693.213.680	35.331	2.436.602.415
		Pangkal :						
		Pas. Batu	837 m3		837	643.981.104	95	73.092.240
		Pas. Beton	268 m3		268	475.388.316	180	319.290.660
		Ganti Box culvert			0	0	0	0
		Manteling			0	0	0	0
		Pilar :						
		Pas. Batu	87 m3		87	66.937.104	0	0
		Pas. Beton	678 m3		678	1.202.661.486	606	1.074.945.222
		Manteling			0	0	0	0
		Hidrolika Sungai :						
		-Drempel	0 m3		0	0	0	0
		-Talud	310 m3		310	238.511.520	310	238.511.520
		-Krib	0 m3		0	0	0	0
2	KLS. II JEM. BETON	Beton (Usul Ganti.)	0 ton		0	0	0	0
		Ganti. Jemb.beton			0	0	0	0
		Ganti Box Culvert			0	0	0	0
		Jemb. Beton	0 m3		0	0	0	0
		Pangkal :						
		Pas. Batu	251 m3		251	193.117.392	0	0
		Pas. Beton	271 m3		271	500.826.509	52	96.099.552
		Pilar :						
		Pas. Batu	8 m3		8	6.155.136	0	0
		Pas. Beton	93 m3		93	171.870.352	0	0
		Cat	0 m2		0	0	0	0
		Penah. Balas	0 m3		0	0	0	0

(Source: PT. KAI)

[Appendix 6-2-2] Samples of Work Sheet



(Source: PT. KAI)



LEMBAR KERJA

PT. KERETA API (PERSERO)

TB.BAAN

RESORT : 6.6 BBN

NO	LOKASI (KMHM)	PANJANG (M)	KORIDOR	H/WHI	PENAHAN BALLAS (M)			PROGRAM PERBAIKAN						KETERANGAN
					PAS. BRONJONG			PAS. BATU KALI						
					M	M3	M	M	M3	M	M3			
1	147+600/850	250	Kt-Lpn	Hi										
2	154+150/480	330	Kt-Lpn	Hi										
3	155+100/450	350	Kt-Lpn	Hi										
4	157+040/300	260	Kt-Lpn	Hi										
5	158+430/550	120	Kt-Lpn	Hi										
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														
18														
19														
20														
JUMLAH KORIDOR:										0		0		7
							1310							

(Source: PT. KAI)



DAFTAR BANTALAN KAYU SP. RAYA
RESORT : 6.6 BBN

LEMBAR KERJA

No	LOKASI Km/ht	KORIDOR	KONDISIBANTALAN						Jumlah		
			Baik		Rsk Kat I		Rsk Kat II		Hulu	Hilir	
			Hulu	Hilir	Hulu	Hilir	Hulu	Hilir	Hulu	Hilir	
1	145 + 3/4	Kt-Lpn								5	
2	152 + 5/6	Kt-Lpn								12	
3	153 + 9/0	Kt-Lpn						2			
4	154 + 4/5	Kt-Lpn				1					
5	154 + 5/6	Kt-Lpn				1					
6	155 + 8/9	Kt-Lpn				3					
7	156 + 0/1	Kt-Lpn						1			5
8	156 + 7/8	Kt-Lpn				1					
9	156 + 9/0	Kt-Lpn				1					
10	157 + 0/1	Kt-Lpn						1			
11	158 + 2/3	Kt-Lpn				1					
12	159 + 3/4	Kt-Lpn				1					
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
		JUMLAH	-	-	-	9	-	4	-	22	-

(Source: PT. KAI)

RENCANA KEGIATAN TAHUNAN 2011		PROGRAM BANGUNAN TAHUNAN 2011		PT. KERETA API (PERSERO)		FORM AB							
BIDANG JALAN		DAOP VI YOGYAKARTA											
NO	OBJECT	KERUSAKAN	PERBAIKAN	SAT	VOLUME								
					RUSAK	IDEAL	BIAYA	TQI	BIAYA	KSLTN	BIAYA		
1	REL	Cacat/defect	1,249 tdk	Ganti di bil kayu Ganti di bil beton	m	6	-	-	-	-	-	-	-
				Popok	m	-	-	-	-	-	-	-	-
				Las	tk	-	-	-	-	-	-	-	-
		Aus	16,231 m	Ganti di bil kayu	m	-	-	-	-	-	-	-	-
		Putus	432 tdk	Ganti di bil beton Ganti di bil kayu	m	-	-	-	-	-	-	-	-
				Ganti di bil beton	m	-	-	-	-	-	-	-	-
				Las	tk	-	-	-	-	-	-	-	-
		Sembungan	316 bh	difawat	tk	41	41	28.729.992	41	28.729.992	41	28.729.992	
		a. Baud Kendor	- bh	pengencangan	bh	-	-	-	-	-	-	-	-
		b. Sembungan	- m	difawat	bh	-	-	-	-	-	-	-	-
		c. Kaki gongsol rusak	- m	diganti	m'	-	-	-	-	-	-	-	-
		d. Rel gongsol rusak	- m	diganti	m'	-	-	-	-	-	-	-	-
	JUMLAH BIAYA REL					-	-	31.126.992	-	31.126.992	-	31.126.992	
2	BANTALAN					-	-	-	-	-	-	-	-
	BETON	Putus / pecah	4,008 bkg	Ganti	bkg	-	-	-	-	-	-	-	-
	KAYU	Lapak / putus	10,661 bkg	Ganti	bkg	-	-	-	-	-	-	-	-
	a. Biasa	Lapak / putus	1,719 bkg	Ganti	bkg	2	2	26.360.000	2	26.360.000			
	b. Wesel	Lapak / putus	1,388 bkg	Ganti	bkg	2	2	6.706.000	2	6.706.000			
	c. Jembatan	Bengkok	1,651 bkg	Ganti	bkg	-	-	-	-	-	-	-	-
	BESI	Idak siku/pasi rusak	- bkg	Perbaikan	bkg	-	-	-	-	-	-	-	-
	BETONKAYUBESI	lippon kendor	- m	pengencangan	m'	-	-	-	-	-	-	-	-
	ALAT PENAMBAT	lippon rusak/hilang	- bh	ganti	bh	-	-	-	-	-	-	-	-
		elastis rusak/hilang	4,424 bh	ganti	bh	18	18	821.700	18	821.700	11	502.150	
		baut siodik rusak/hilang	38	ganti	bh	-	-	-	-	-	-	-	-
		baut sambung rusak/hilang	- bh	ganti	bh	-	-	-	-	-	-	-	-
	JUMLAH BIAYA BANTALAN					-	-	33.887.700	-	33.887.700	-	9.502.150	

(Source: PT. KAI)

[Appendix 10-1-1] Environmental Screening Guideline

An environmental screening of each proposed project should be conducted by an implementing agency in each country. However the agency is not decided in the study. Therefore the study team conducts the environmental screening for the project.

Check Items

Question 1: Address of project site

South Sumatra province, Republic of Indonesia

Question 2: Scale and contents of the project (approximate area, facilities area, production, electricity generated, etc.)

- Whole double tracking work between Sucacinta and kertapati(190km)
- Development of cosl stock yard in Kertapati station area of 20 ha
- Coal transportation capacity : 20.0 MTPA

2-1. Project profile (scale and contents)

- Whole double tracking work between Sucacinta and kertapati(190km) for Capacity Expansion
- Construction of branch line of 700 m from Merapi to main line
- Development of coal stock yard in Kertapati station area of 20 ha

2-2. How was the necessity of the project confirmed?

Is the project consistent with the higher program/policy?

- YES : The railway development long-term plan
(Rencana Induk Perkeretaapian Nasional)
RENSTRA (2010-2014, Rencana Strategis=Strategy Plan)

NO

2-3. Did the proponent consider alternatives before this request?

- YES : Please describe outline of the alternatives
Zero-Option is considered.

NO

2-4. Did the proponent implement meetings with the related stakeholders before this request?

Implemented Not implemented

If implemented, please mark the following stakeholders.

Administrative body

Local residents

NGO

Others ()

Accordance with the EIA process of Indonesia, project owner have to announce the contents of project after project is finalized.

Question 3:

Is the project a new one or an ongoing one? In the case of an ongoing project, have you received strong complaints or other comments from local residents?

New Ongoing (with complaints) Ongoing (without complaints)

Other

No complaints is received until now because the contents of project is not released, yet.

However, it is necessary to announce a detail of this project to build a consensus with local residents to allow smooth resettlement implementation.

Question 4:

Is an Environmental Impact Assessment (EIA), including an Initial Environmental Examination (IEE) Is, required for the project according to a law or guidelines of a host country? If yes, is EIA implemented or planned? If necessary, please fill in the reason why EIA is required.

Necessity (Implemented Ongoing/planning)

(Reason why EIA is required: Railway construction project that has over 25 km length is necessary to implement EIA.)

Not necessary

Other (please explain)

Question 5:

In the case that steps were taken for an EIA, was the EIA approved by the relevant laws of the host country? If yes, please note the date of approval and the competent authority.

Approved without a supplementary condition

Approved with a supplementary condition

Under appraisal

(Date of approval: Competent authority:)

Under implementation

- Appraisal process not yet started
- Other ()

Question 6:

If the project requires a certificate regarding the environment and society other than an EIA, please indicate the title of said certificate. Was it approved?

- Already certified
- Requires a certificate but not yet approved

Title of the certificate: Permission of occupancy of road, agreement of waste management with Palembang City is necessary.

- Not required
- Other

Question 7:

Are any of the following areas present either inside or surrounding the project site?

- Yes
- No

This railway improvement project is conducted in Lahat to Kertapati.

However, this project area is not containing environmental / social important area including followings.

If yes, please mark the corresponding items.

- National parks, protection areas designated by the government (coastline, wetlands, reserved area for ethnic or indigenous people, cultural heritage)
- Primeval forests, tropical natural forests
- Ecologically important habitats (coral reefs, mangrove wetlands, tidal flats, etc.)
- Habitats of endangered species for which protection is required under local laws and/or international treaties
- Areas that run the risk of a large scale increase in soil salinity or soil erosion
- Remarkable desertification areas
- Areas with special values from an archaeological, historical, and/or cultural points of view
- Habitats of minorities, indigenous people, or nomadic people with a traditional lifestyle, or areas with special social value

Question 8:

Does the project include any of the following items?

- Yes
- No

If yes, please mark the appropriate items.

- Involuntary resettlement (scale: 1,200 households persons)

- Groundwater pumping (scale: m³/year)
- Land reclamation, land development, and/or land-clearing (scale: hectares)
- Logging (scale: hectares)

Question 9:

Please mark related environmental and social impacts, and describe their outlines.

- Air pollution
- Water pollution
- Soil pollution
- Waste
- Noise and vibrations
- Ground subsidence
- Offensive odors
- Geographical features
- Bottom sediment
- Biota and ecosystems
- Water usage
- Accidents
- Global warming
- Involuntary resettlement
- Local economies, such as employment, livelihood, etc.
- Land use and utilization of local resources
- Social institutions such as social infrastructure and local decision-making institutions
- Existing social infrastructures and services
- Poor, indigenous, or ethnic people
- Misdistribution of benefits and damages
- Local conflicts of interest
- Limitation of accessibility to information, meetings, etc. on a specific person or group
- Gender
- Children's rights
- Cultural heritage
- Infectious diseases such as HIV/AIDS
- Other ()
- Outline of related impact: during construction period

Question 10:

In the case of a loan project such as a two-step loan or a sector loan, can sub-projects be specified at the present time?

Yes No 「not yet determined」

Question 11:

Regarding information disclosure and meetings with stakeholders, if JICA's environmental and social considerations are required, does the proponent agree to information disclosure and meetings with stakeholders through these guidelines?

Yes No

[Appendix 10-1-2] JICA Screening Form for Environmental Issues

(1/8)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits/EIA	(a) Have EIA reports already been prepared in the official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) N (b) N (c) N (d) N	(a) EIA report will be prepared. (b) After the EIA report is developed, the EIA report is approved in accordance with the decided procedure in Indonesia. (c) In the process of EIA report development, imposed conditions are reflected in the contents of the EIA report. (d) Permission from local government (South Sumatra province,) about construction implementation (ex. occupancy of roads) should be obtained
	(2) Explanation to the Local stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comments from the stakeholders (such as local residents) been reflected to the project design?	(a) N (b) N	(a) Railway improvement project is not announced to local stake holders until now. However, in accordance with the AMDAL procedure in Indonesia, contents of the project will be discussed with local stake holders. (b) same as above
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations? (a) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas?	(a) Y	(a) This study considered Zero-Option. (a) The adoption of sediment suppression method.
2 Pollution Control	(1) Water Quality		(a) N	

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
2 Pollution Control	(1) Water Quality	(b) Do effluents from the project facilities, such as stations, comply with the country's effluent standards and ambient water quality standards? Is there a possibility that the effluents will cause areas not to comply with the country's ambient water quality standards?	(b) Y	(b) Major wastewater in this project is domestic wastewater from stations and depots. Possibility of violation of water quality standard is low.
	(2) Wastes	(a) Are wastes generated from the project facilities, such as stations and depots, properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a) Major waste is solid waste from depots and workshop. In the existing condition, these solid wastes are collected and stored by the railway company, and disposed of by a waste disposal company. On the other hand, waste from stations is collected by and disposed of by the municipal authority.
	(3) Noise and Vibration	(a) Do noise and vibrations from the vehicle and train traffic comply with the country's standards?	(a) No data	(a) No data
	(4) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence (especially in case of Undergrounds/Subways)?	(a) N	(a) Groundwater extraction is not implemented in this project.
3 Natural Environment	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	(a) There is no environmental protected area designated by the country's laws or international treaties and conventions in the project area.
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?	(a) N (b) N	(a) There are no primeval forests, tropical rain forests and ecologically valuable habitats in the project area. (b) Protected habitats and endangered species are not reported in the project area.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
3 Natural Environment	(2) Ecosystem	<p>(c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?</p> <p>(d) Are adequate protection measures taken to prevent impacts, such as disruption of migration routes, habitat fragmentation, and traffic accidents involving wildlife and livestock?</p> <p>(e) Is there a possibility that installation of railroads will have impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered?</p> <p>(f) In cases where the project site is located at undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments?</p>	<p>(c) N (d) N (e) N (f) N</p>	<p>(c) This project does not contain an environmentally susceptible area.</p> <p>(d) This project does not contain the habitat of wild life.</p> <p>(e) An adverse effect to the natural environment is not expected.</p> <p>(f) This project site is located in a developed area. Extensive loss of natural environment is not expected.</p>
	(3) Hydrology	(a) Is there a possibility that alteration of topographic features and installation of structures, such as tunnels will adversely affect surface water and groundwater flows?	(a) N	(a) Hydrological change by this project is not expected.
	(4) Topography and Geology	<p>(a) Is there soft ground on the route that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed?</p> <p>(b) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides?</p>	<p>(a) N (b) N</p>	<p>(a) Long slope to the mild-slope stability is obtained sufficiently.</p> <p>(b) In order to prevent landslides and landslides, to implement appropriate measures of Engineering drainage, retaining wall engineering, such as spraying of Engineering.</p>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
3 Natural Environment	(4) Topography and Geology	<p>(c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?</p>	(c) N	(c) Installation of sediment accumulation, of fence.
4 Social Environment	(1) Resettlement	<p>(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?</p> <p>(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>(d) Are the compensations going to be paid prior to the resettlement?</p> <p>(e) Are the compensation policies prepared in a document?</p> <p>(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities and indigenous peoples?</p> <p>(g) Are agreements with the affected people obtained prior to resettlement?</p> <p>(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of Resettlement?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p> <p>(d) Y</p> <p>(e) Y</p> <p>(f) Y</p> <p>(g) Y</p> <p>(h) Y</p> <p>(i) Y</p>	<p>(a) To reduce the number of resettlements.</p> <p>(b) In AMDAL procedure, there are 2 times (assessment of TOR and assessment of EIA report) to explain resettlement to inhabitants and stake holders.</p> <p>(c) According to the LARAP.</p> <p>(d) Detailed relocation procedure is decided after project implementation is decided.</p> <p>(e) According to the LARAP.</p> <p>(f) No particular vulnerable group was recognized in the project area.</p> <p>(g) Detailed relocation procedure is decided after project implementation is decided.</p> <p>(h) Organization framework for resettlement is decided after project implementation is decided.</p> <p>(i) In accordance with the EIA procedure of Indonesia, an adequate monitoring plan and management plan are involved in EIA document.</p>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(1) Resettlement	(j) Is the grievance redress mechanism established?	(j) Y	(j) In accordance with the EIA procedure of Indonesia, an adequate monitoring plan and management plan including grievance redress mechanism are involved in the EIA document.
	(2) Living and Livelihood	<p>(a) Where railways are newly installed, is there a possibility that the project will affect the existing means of transportation and the associated workers? Is there a possibility that the project will cause significant impacts, such as extensive alteration of existing land uses, changes in sources of livelihood, or unemployment? Are adequate measures considered for preventing these impacts?</p> <p>(b) Is there any possibility that the project will adversely affect the living conditions of inhabitants other than the affected inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>(c) Is there any possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?</p> <p>(d) Is there any possibility that the project will adversely affect road traffic in the surrounding areas (e.g., by causing increases in traffic congestion and traffic accidents)?</p> <p>(e) Is there any possibility that railways will impede the movement of inhabitants?</p> <p>(f) Is there any possibility that structures associated with railways (such as bridges) will cause sun shading and radio interference?</p>	<p>(a) N (b) N (c) N (d) N (e) N (f) N</p>	<p>(a) The main transportation measure in this project area is private motorcycles and private passenger cars. Therefore, serious adverse effects to existing transportation measures, e.g. Taxis, Mini buses, etc., are not expected.</p> <p>(b) Adverse effects to the inhabitants near the railway are not expected.</p> <p>(c) Expansion of diseases including HIV is not expected.</p> <p>(d) Contemplated by the increase number of train, train hen growth, but the expected increase in congestion level crossing, there is little impact.</p> <p>(e) same as above</p> <p>(f) Sun shading is not expected.</p>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?	(j) Y	(a) If there is a cultural heritage, in accordance with the country's laws.
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) Serious adverse effect to local landscape is not expected.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a) N (b) N	(a) No ethnic minority is identified in the project area. (b) No ethnic minority is identified in the project area.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate the safety of other individuals involved, or local residents?	(a) Y (b) Y (c) Y (d) Y	(a) Monitoring of working conditions should be described in the environmental monitoring plan and environmental management plan in the EIA document. (b) Detailed management procedure is considered in the EIA document. (c) Individual safety training and health management should be involved in the safety management procedure. Detailed management procedure is considered in the EIA document. (d) Appropriate safety guard procedures (e.g. arrangement of night watch) should be considered. Details of this procedure will be considered in the EIA document.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
5 Others	(1) Impacts during Construction	<p>(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p> <p>(d) If the construction activities might cause traffic congestion, are adequate measures considered to reduce such impacts?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p> <p>(d) Y</p>	<p>(a) An environmental monitoring and management plan is considered in the EIA document.</p> <p>(b) An environmental monitoring and management plan is considered in the EIA document.</p> <p>(c) Social monitoring and management is described in the environment monitoring plan and environmental management plan. A detailed monitoring plan is considered in the EIA document.</p> <p>(d) Adequate traffic control measures (establishment of diversion routes, etc.) should be considered. Detailed measures are considered in the EIA document.</p>
	(2) Monitoring	<p>(a) Does the proponent develop and implement a monitoring program for the environmental items that are considered to have potential impacts?</p> <p>(b) What are the items, methods and frequencies of the monitoring program?</p> <p>(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>(d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p> <p>(d) Y</p>	<p>(a) An environmental monitoring plan and environmental management plan have to be involved in the EIA document.</p> <p>(b) A detailed monitoring plan is established in the EIA development process.</p> <p>(c) Description of the monitoring framework is essential in the environmental monitoring plan and environmental management plan. These are established in z EIA document.</p> <p>(d) Monitoring reporting is included in the environmental monitoring plan and environmental management plan in the EIA document.</p>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
6 Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry Projects checklist should also be checked (e.g., projects including large areas of deforestation). (b) Where necessary, pertinent items described in the Power Transmission and Distribution Lines checklist should also be checked (e.g., projects including installation of power transmission lines and/or electric distribution facilities).	(a) N (b) N	(a) Deforestation is not included. (b) Power Transmission and Distribution Lines are not included.
	Note on Using the Environmental Checklist	(a) If necessary, the impacts to trans boundary or global issues should be confirmed(e.g., the project includes factors that may cause problems, such as trans boundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) N	(a) Environmental impacts to trans boundary or global issues are not expected.

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.

In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience)

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

DRAFT OF INITIAL ENVIRONMENTAL EXAMINATION

Executive Summary

First Stage of Capacity Expansion Railway Line Lahat - Kertapati in South Sumatera - Indonesia



PPLH UNIVERSITAS SRIWIJAYA
Jalan Padang Selasa No. 531 RT. 24 Bukit Besar Palembang 30139
Jalan Raya Palembang – Prabumulih Gedung Perpustakaan Kampus
Unsri Km. 32 Inderalaya Ogan ilir 30662
Telp/Fax. (0711) 355805 / 580640, email : pplh.unsri@gmail.com



EXECUTIVE SUMMARY

I. Introduction

Indonesia is the fourth most populous nation in the world, and the second most populous in east Asia after China. Total population in Indonesia in 2010 was 237,641,326, including those residing in urban areas as many as 118,320,256 persons (49.79%) and in rural areas as many as 119,321,070 persons (50.21%). In South Sumatra Province itself, total Population was 7,222,635 persons.

According to BPS-Statistics Indonesia, Indonesia's economy in 2011 grew by 6.5% compared to the year 2010. When viewed under current prices, GDP in 2011 rose by 990.8 trillion IDR, which is of 6,436.3 trillion IDR by the year 2010 amounted to 7,427.1 trillion IDR in 2011. This reflects the resilience and strength of the market economy is an important component of the global economy.

In Coordinating Meeting Sumatran Governor in Palembang, July 28th, 2011, Minister of Energy and Mineral Resources affirmed Sumatran strategic position as "*Sentra Produksi dan Pengolahan Hasil Bumi dan Lumbung Energi Nasional*" (Production and Processing Center for Agricultural Products and National Energy Barn) in Master plan of Acceleration and Expansion of Economic Development Indonesia (MP3EI) 2011-2025, which leads Indonesia to become one of top 10 in the world's economic power. Sumatra has big coal reserves, which reach 52.5 billion tonnes with its reserves 11.5 billion tonnes, and also coal production for about 16 million ton (2010). This production level is very smaller than its reserves.

In the South Sumatra Province, the potential natural resources in the form of coal reserves is very large, generally found in the district of Lahat, Muara Enim, Musi Banyuasin and Musi Rawas. Currently the railway network is operated by PT. Kereta Api Indonesia (PT. KAI) to transport passenger (Palembang-Lubuk Linggau-Lahat) as well as coal from PT. Bukit Asam (PT. BA), PT. Bara Alam Utama (PT. BAU), PT. Bara Multi Sugih Sentosa (PT. BMSS) and PT. Semen Baturaja.

Directorate General of Railways of Republic of Indonesia (DRG) is the entity responsible for managing and operating railway transport in Indonesia. The problem is that the transportation capacities such as railway lines and roads are limited.

PT. Kereta Api Indonesia (PT. KAI) is planning to improve the capacity expansion of the Lahat-Kertapati line. Extension of track effective length and existing track improvement work including partial replacement of rail of existing track are necessary in order to meet increasing national and international coal demands. An integrated transportation system will contribute significantly to the sustainable development of the regional economy and energy in coming the 21st century.

The first stage of railway capacity expansion was confined to the railway line from Lahat to Kertapati. The 1st stage also includes the existing track improvement work as well as partial replacement of rail of existing track, increasing capacity to 2.5 MTPA with number

of train per day will be 8 trains, extension of track effective length is about 445 m. The project scope also, shall cover not only transportation capacity expansion but also balanced loading/unloading facility (expansion of coal loading in Sukacinta and expansion of unloading in Kertapati), and capacity expansion of Depot. As for loading/unloading expansion facilities, the existing facilities should be the basis of the planning.

The scope of this report includes ecological environment, noise pollution, air pollution, water pollution, public safety and health, and socio-economic aspects. It also includes mitigation measures, an environmental management and monitoring plans. The Project area includes five administrative areas; Lahat, Muara Enim, Prabumulih, Ogan Ilir and Palembang. The overall Project assessment encompasses the Project area.

II. Project Description

In the South Sumatra Province, the potential natural resources in the form of coal reserves is very large, generally found in the district of Lahat, Muara Enim, Musi Banyuasin and Musi Rawas. The expected coal reserve in Tanjungenim is 15.6 billion tonnes. That is, although mining is maximized up to 50 million tons annually, will not run out of coal mined for 200 years. But the abundant content of coal is not supported by the mine site includes inadequate transportation facilities. Before 2008, the transportation of coal mining in South Sumatra can only be transported by rail to the port dock Kertapati (Palembang) and Tarahan (Lampung). Because of the increasing demand, currently coal commodity in South Sumatra is transported by two main modes, roadway and railway. The roadway mode is facilitated by the Trans-Sumatra, national roadway network, both in the east and in the middle. While the railway mode is served by the railway network in the operation area of Divisi Regional (DIVRE)-III Palembang, from Kertapati-Prabumulih-Lubuk Linggau and Kertapati-Prabumulih-Tanjung Karang. The railway network operated by PT. Kereta Api Indonesia (PT. KAI) currently is served for PT. Bukit Asam (PT. BA), PT. Bara Alam Utama (PT. BAU), PT. Bara Multi Sugih Sentosa (PT. BMSS) and PT. Semen Baturaja.

The first stage of railway capacity expansion was confined to the railway line from Lahat to Kertapati. Scope of the 1st stage of Lahat-Kertapati Railway line expansion project (IEE) includes: (1) Increasing transport capacity (2.5 MTPA); (2) Increasing number of train per day (8 trains); (3) Extending track effective length (about 445 m = 395 m + 50m) of each point; (4) Improving existing track including partial replacement; (5) Capacity expansion of coal loading facility in Sukacinta; (6) Capacity expansion of coal unloading facility of PT. BAU in Kertapati; and (7) Capacity expansion of depot.

The scope of this report includes ecological environment, noise pollution, air pollution, water pollution, public safety and health, and socio-economic aspects. It also includes mitigation measures, an environmental management and monitoring plans. The Project area includes five administrative areas; Lahat, Muara Enim, Prabumulih, Ogan Ilir and Palembang. The overall Project assessment encompasses the Project area.

Under JICA Guidelines (April 2010), this first stage proposed project is classified as category B, that potential adverse impacts on the environment, normal mitigation measures can be designed more readily.

III. Description of The Environment

The project study area encompasses 3 regencies; Lahat, Muara Enim, Ogan Ilir and 2 cities; Prabumulih and Palembang in South Sumatra Province. The loading facilities are located in Sukamarga village of Lahat Regency. The existing loading area is around 5 ha. The existing loading facilities is located in Sukamarga village nearby the Sukacinta Station, it is side by side with residency, traditional market, school, and plantation. The unloading facility of PT. BAU is about 1 ha, located at the Kertapati station in Palembang city nearby Musi River. It is prepared for interconnected transportation from train to ship through Musi River.

The dominant soil types found around the project area based on the classification of Soil Taxonomy. Along the railway line Lahat-Kertapati consist of soil type Inceptisol and Ultisol, which is based on its field Unit. The unit consists of dominant soil groups, Acid Tuff Plain and Alluvial.

South Sumatra Province has some large rivers which are navigable. Unfortunately, because of the silting process, these are not navigable anymore these days. Most springs of them come from Bukit Barisan except Mesuji, Lalan and Banyuasin rivers.

The season in South Sumatra is generally the same as the season in any other parts of Indonesia. In Indonesia, there are two seasons, dry and rainy seasons. In June to September the wind blew from Australia and did not contain much moisture which resulted in the dry season. Whereas in December to March, the wind stream containing vapor that came from Asia and the Pacific Ocean occurred in the rainy season. The situation like this happened every mid year after passing the transitional period in April-May and October-November.

The vegetation in the area along Lahat-Kertapati Railway has been extensively modified by human activity. The closest remaining area of natural vegetation is Bukit Serelo Natural Park, which located about 5 km from the existing line. Bukit Serelo Natural Park is protected, although under threat from clearance for agricultural activities. The natural forest has been adapted for tree cropping, mainly of rubber, oil palm and some coffee plantation in higher area. In some areas the forest vegetation has been completely cleared for agriculture and some has been abandoned as grassland.

The forest fauna has been severely affected by human encroachment, particularly forest clearance. Based on the estimated forest degradation rate, it has been suggested the serious degree to which the large mammal population has subsequently declined. The elephant population remains in the Bukit Serelo Nature Park. Birds' habitats are exceedingly important.

The Project is located in the South Sumatra Province and covers 3 regencies (Lahat, Muara Enim, and Ogan Ilir) and 2 cities; (Prabumulih and Palembang). The capacity expansion project of coal loading facility of PT. BAU is located nearby Sukacinta Station, in the Suka Marga village of Merapi Barat District Lahat Regency.

IV. Environmental Impacts and Mitigative Measures

The Project alignment is an existing one that will be constructed. The impacts related to construction are typical of any construction activity, but are mostly short-term and reversible. There are no significant long-term irreversible impacts resulting from the Project, especially if it is properly managed during the operation phase.

Overall, the IEE is identified that possible impacts are expected to be temporary and could be mitigated or reduced by implementing proper measures indicated in the environmental management plan throughout the Project cycle. Moreover, it identified that there would be no major impacts on water resources, ecological resources and physical along the alignment. Even though, it should be take care very carefully around the unloading area, specifically the northern side of unloading area, there is Islamic historical place called Ki Muara Ogan Mosque. This mosque was established in 1310 H or 1890 AD. Beside the mosque, there is a sacred tomb of Kiai Merogan until now and become one of the most visited mosque by pilgrims from different area. Given the distance from the alignment, and the mild nature of the construction activities, impacts are unlikely.

Potential impacts include emission of pollutants into the air, surface waters and soil, as well as changes in the acoustic environment, and generation of waste associated with both the construction activities and the operation of the railway line. This is mainly a concern in the areas with higher population densities. Further, contamination of water is a concern during the construction activities in case of accidental oil spills during implementation, particularly within the Lematang and Musi Rivers. Waste will be generated both during implementation and operation periods and shall be stored in, and transported to places specialized for that purpose.

Like any construction activity, the earthmoving and compaction requirements are likely to generate dust. The impacts associated with generated dust are significant only where work is taking place close to residential or populated areas. The Contractor shall utilize dust suppressants and utilize water spraying to minimize such impacts near residential areas. Practices such as covering trucks hauling materials, spraying during the loading and unloading of such materials shall also be practiced.

Based on existing environmental conditions along the track, ambient air quality along the railway line is generally good and pollution concentrations are well below the South Sumatera Governor Regulation on Ambient Air Quality Standards. During the operation period, no significant air pollution is expected. On the contrary, improving the railway's service and competitiveness is expected to result in traffic diversion from road to rail.

The Contractor shall guarantee that all river beds and drainage areas close to any of the construction sites will be maintained and in good condition. This includes preventive practices to avoid accidental and non-accidental disposal of materials and/or other particles originated by the works near those water resources. During the operation period, no significant surface water pollution is expected. However, there is a concern about impacts that would arise from a possible derailment during the operational phase that could lead to oil and/or chemical spills. Proposed mitigating

measures include imposing a lower running speed in those sections, and/or have an oil spill containment/clean-up plan and necessary equipment readily available.

During the construction phase, expected wastewater sources mainly entail domestic sewage from workers camps and staff quarters, and to a lesser extent industrial wastewater from washing of equipment and vehicles. In addition to strict and proper management of both liquid and solid waste at such locations, the workers camps will also adopt water-efficient practices and increase the awareness of workers to minimize the discharge of wastewater.

Generally, the operation of equipment during the construction of railway projects generates noise and vibration. As there are some densely populated communities along the alignment, noise or vibration impacts could be expected during implementation. However, this is a temporary activity with minimal disturbance. As some of the work will be near sensitive receptors, any significant noise or vibration shall be managed properly. Practices such as managing running speeds of equipment, continuous maintenance of such equipment, minimizing idle times of such equipment for some of the louder equipment will all help mitigate this impact during implementation.

Being a construction activity that will allow train services to continue to operate during the day, construction activities and transportation of materials and work items will be limited to the night hours. This shall be highly coordinated with representatives in the local communities when the works are near sensitive receptors, and the Contractor shall make all efforts to complete those sections as efficiently as possible to minimize such noise impacts. Furthermore, the Contractor shall utilize additional noise control measures to be undertaken. In this respect, noise control measures shall include provision of acoustic dampers and encasement of the noise generating equipment, as well as effective preventive maintenance and vibration measurement of all rotating equipment. Further, silencers on engines and noise suppression kits shall be used on the various construction equipments to reduce noise during construction works.

Depending on the conditions of the equipment used for such activities, there is a concern of contamination resulting from leaks, spills, and disposal of oil, lubricants or other chemicals. The impacts of such spills are usually confined to local contamination, thus, unlikely to be significant. The lack of any sensitive receptors along most of the alignment further reduces the likely significance (water resources and agricultural lands). However, the Contractor shall practice all necessary action to maintain equipment in good operating conditions and to ensure compliance with work safety practices to eliminate the possibility of any such spills.

During the implementation phase of the Project, unskilled labor will be required. Therefore, employment opportunities will benefit local residents.

V. Institutional Requirements and Environmental Monitoring Plan

Relevant Organizations and Responsibilities for Environmental Aspects are Ministerial of Environment (KLH), Directorate General of Railways, Ministerial of Transportation, Regional Environmental Agency (BLH) Province or Regency/ City, and other related institutions which are either government or private agencies at central and regional levels.

Mostly railway projects in Indonesia were implemented by the Directorate General of Railways (DGR) of Ministry of Transport. The main implementing organization for operation will be PT. KAI under the Directorate General of Railways (DGR).

Environmental monitoring is a vital tool to be used during the construction works and operation stages of the Project. This will ensure safeguarding the protection of the environment and to ascertain that the negative environmental impacts can be controlled and mitigated effectively. Again, given that the operational phase is expected to have environmental impacts (especially with the improved operation, higher train volumes, and higher operating speeds), a detailed EMMP is required.

VI. Public Consultations

Public consultation is required to provide information to the public, especially groups of people who may be impacted due to rail way construction in the region. It is very important to their aspirations in the form of opinions, proposals and suggestions for consideration in the planning process or a network of railways to be constructed / upgraded.

This public consultation is a forum of community involvement in the planning process, and hopefully as the social impact of prevention efforts as early as possible.

VII. Finding and Recommendation

The IEE shows that no major negative environmental impacts are expected as a result of the project, if these projects are conducted following environmental regulations carefully. The Project will have some minor environmental impacts, which will be both positive and negative. Implementation of appropriate mitigation measures during the expansion works and operation phases will minimize the negative impacts of the Project to acceptable levels.

To ensure that these mitigation measures are implemented and negative impacts avoided, the measures shall be incorporated in the operational phase. Environmental monitoring of the Project will be undertaken regularly throughout the first three stages of its operation to ensure that the measures are being implemented properly.

VIII. CONCLUSIONS

The Project activities will have both positive and negative impacts to the environment. The IEE findings clearly show that the Project will have socioeconomic benefits. If the prescribed mitigation and management measures are fully implemented, it is unlikely to have significant adverse environmental impacts. An environmental management and environmental monitoring plan should be prepared for implementation assigned.

DRAFT OF INITIAL ENVIRONMENTAL EXAMINATION

Executive Summary

Second Stage of Capacity Expansion Railway Line Lahat - Kertapati in South Sumatera - Indonesia



PPLH UNIVERSITAS SRIWIJAYA
Jalan Padang Selasa No. 531 RT. 24 Bukit Besar Palembang 30139
Jalan Raya Palembang – Prabumulih Gedung Perpustakaan Kampus
Unsri Km. 32 Inderalaya Ogan ilir 30662
Telp/Fax. (0711) 355805 / 580640, email : pplh.unsri@gmail.com



EXECUTIVE SUMMARY

1. Introduction

Indonesia has all the potential of natural resources, minerals, and maritime. These potential resources is needed for national economy. To achieve economic advance, Indonesia should build the infrastructure, industry, and the national railway services. Some reason why rail transportation is important because of its highly competitive and efficient in energy consumption, noise, CO₂ emissions, and more environmentally friendly than highway modes. Also, rail mode of transportation is the most efficient use by the public. Train not only can carry a passenger with a lot and fast, but it also brings the goods, container, livestock, mining products, crops, etc. quickly and cheaply.

Indonesian Railways Act Number 23 Year 2007 and Government Regulation Number 56 Year 2009 and Number 72 Year 2009 have given way for the reconstruction of railways Indonesia massively and rapidly. Railways in Indonesia is no longer a monopoly by the state and therefore the construction can be carried out jointly or separately by the government, local governments, state enterprises, enterprises, and private sector.

The coal transportation was into earning power for PT. KAI Divre III of South Sumatra. Number of charges of coal transportation in South Sumatra grew from year by year. However, infrastructure and capacity of PT. KAI is very limited. To solve these, a variety of investments to develop the capacity of the infrastructure and locomotives and carriages, including a program to increase the number and length of passing loops are needed. Also, railway investment is just one of the whole logistic chains that include: loading facilities at the mine, rail infrastructure and locomotives and carriages, rail unloading facility and ship loading at the port.

2. Description of Project

The second stage project of Capacity Expansion of Railway Line Lahat-Kertapati includes: (1) increasing transport capacity to 5.0 MTPA; (2) increasing number of train per day will be 10 trains; (3) extension of track effective length to 665 m (615 m of trains length + 50 m safety); (4) complete the double tracking work between Muara Enim and X6, (5) the addition of two signal stations, (6) construction of branch line of 700 m from Merapi to main line, (7) construction of stockyard and unloading facility in the north end of Kertapati station area and; (8) capacity expansion of depot. See Figure 2.1 for the scope of second stage project of Lahat-Kertapati railway line capacity expansion.

The project study area encompasses 3 regency; Lahat, Muara Enim, Ogan Ilir and 2 cities; Prabumulih and Palembang in South Sumatra Province. The South Sumatra Province consists of 11 Regencies and 4 Cities.

3. Existing Environmental Condition

Geographically, South Sumatra Province is located between 1 to 4 degrees of south latitude and between 102 to 106 degrees of east longitude with total area of 87,017 Km². On the east coast of South Sumatra, the land of swamps and marshes are influenced by tidal fluctuation. In those areas, there are *palmae* plants and mangrove vegetation. A little further to the west, there is a wide area of lowland. Far inside the western part of the island, the land contour is mountainous.

There is Bukit Barisan that lies along Sumatra Island. Bukit Barisan consists of peaks of Mount Seminung, Mount Dempo, Mount Patah, and Mount Bungkuk. On the western side of Bukit Barisan, there is a slope area. Along the valley of Bukit Barisan lies area of rubber plantations, palm oil plantation, and estates mainly coffee, tea and wide variety of vegetables.

The season in South Sumatra is generally the same as the season in any other parts of Indonesia. In Indonesia, there are two seasons, dry and rainy seasons. Sumatra Selatan province has a tropical and wet climate.

The dominant soil types found around the project area based on the classification of Soil Taxonomy. Along the railway line Lahat-Kertapati consist of soil type Inceptisol and Ultisol, which is based on its field Unit.

South Sumatra Province has some large rivers which are navigable. Unfortunately, because of the silting process, these are not navigable anymore these days. Most springs of them come from Bukit Barisan except Mesuji, Lalan and Banyuasin rivers.

Among those rivers, Musi river springs at Bukit Barisan and ends at Bangka Strait. On the other hand, Ogan, Komering, Lematang, Kelingi, Lakitan, Rupit and Rawas rivers are tributaries of Musi River.

The vegetation in the area along Lahat-Kertapati Railway has been extensively modified by human activity. The closest remaining area of natural vegetation is Bukit Serelo Natural Park, which located about 5 km from the existing line. Bukit Serelo Natural Park is protected, although under threat from clearance for agricultural activities. The natural forest has been adapted for tree cropping, mainly of rubber, oil palm and some coffee plantation in higher area. In some areas the forest vegetation has been completely cleared for agriculture and some has been abandoned as grassland.

There are four areas of protected natural forest away from the area of The Project for Capacity Expansion of Railway Line Lahat-Kertapati. Two of these are designated parks and reserves, i.e.: Bukit Serelo Nature Park and Isau-Isau Pasemah Nature Reserve.

Protected species are vulnerable to extinction naturally and because of human activities. In Indonesia, there are two groups of animals which are vulnerable by human activities, i.e. (1) Species that exploitation rate higher than its reproduction, (2) Species that only can dwell in forest, so if the forest under exploitation of human activities, this group will be threatened, and hence, the growth and reproductive activities of this will eventually under stress.

South Sumatra populated by 7.4 million people with the natives of South Sumatra consists of ethnic groups with many languages and local dialects. Each ethnic group has a tradition and culture. Most of ethnic group in South Sumatra have both differences and similarities in art and culture. Moslems are majority in South Sumatra that affecting habitual daily life.

Administratively, South Sumatra Province consists of 11 (eleven) regencies and 4 (four) City Governments, along with the Regional Representatives Council.

4. Project Environmental Impact and Mitigation Measurement

The potential impacts that could arise from the project had been assessed. Those activities that have no potential to cause a significant environmental impact had been screened out, allowing the impact assessment and the development of mitigation measures to focus on the significant issues. Human activity is concentrated around the Kertapati station and northern ends of the alignment and the construction and operation of the stockpile expansion in this area had been assessed for its possible impacts. The results of the screening process identified that there would be an impacts on surface water, ground water, ecological resources or physical and Islamic historical place around the planned expansion unloading area.

The key impacts identified were noise, vibration and air quality issues associated with both the construction and operation of the rail line. Issues associated with any camps during construction were also identified as being potential impacts. Construction materials is assumed to be transported by trucks and using the existing rails, therefore vehicle movements may also result in significant impacts.

During the construction of the rail line will along Merapi to main line require earthmoving and compaction to provide a suitable base for the track. Environmental impacts that could occur during the preparation of the track base include contamination resulting from spills or disposal of oil, lubricants or other chemicals. The impacts of any spills are likely to be confined to very local contamination and therefore are unlikely to be significant. The lack of any sensitive receptors along most of the alignment further reduces the likely significance.

In order to minimize the likelihood of spills and to ensure proper clean up if a spill occurs the following measures will be included in the EMP. All hazardous wastes and hazardous materials, lubricating oil, solvents and fuels, will be stored within a bunded area that has the capacity of at least 110% of the largest container in the storage area. Oil spill clean-up materials (sorbent pads, loose sorbent material, etc.) will be made available. Any spill or leak shall be addressed immediately and the contaminated soil and material be disposed appropriately, as regulated by the Decree of Head of BAPEDAL No. 1 to 5 year 1995.

The sources of construction materials such as cement, ballast, sleepers and track have not yet been finalized. Unlicensed quarries and cement plants have the potential to create significant environmental impacts if not operated properly. Truck movements may disturb and disrupt villages and towns. Ballast and cement must be obtained from licensed facilities and the contractor must ensure vehicles use haulage routes that avoid villages and towns.

Trains using the line will carry a variety of materials and may include wagons carrying bulk liquids. The unloading of bulk fuel carriers will present a risk of significant spills if not undertaken in a controlled manner. At present the freight handling facilities are still at the concept design stage; if bulk storage of fuel is included as part of the detailed design then the facilities must be designed in accordance with a suitable international or national standard as regulated by the Decree of Head of BAPEDAL No. 1 to 5 year 1995. The proposed construction of the alignment at hand may result in soil erosion and contamination particularly around rock cuttings, embankments, workers camps, workshop areas, equipment washing yards, and fuel and chemical storage areas.

Slight impacts on the area's topography may occur due to establishment of access roads. Cut and fill operations are the activities that are most likely to impact the topography. These are mainly carried out during the construction works of the railway itself and access roads, if any. They have negative impacts on the topography, but the magnitude of these impacts is low/medium due to flat terrain and comparatively small areas to be affected. Intensification of soil erosion processes is the major consequence of cut and fill.

Erosion mitigation will be part of the track construction works by including slope stabilization measures such as embankment reinforcement and provision of vegetation cover. To avoid landslides in steep areas, measures shall be provided such as masonry breast walls, ditch type drains along slope toes, and small toe walls against adversely dipping rock beds. Impacts caused by soil erosion and contamination will be minimized by limiting, as much as possible, extraction of materials to nonproductive land areas and slopes with the least erosion potential; and by observing appropriate depths.

Provision of fast-growing vegetation on embankments will prevent scouring and encourage stabilization. Soil contamination by fuel and chemical storages shall be minimized by siting these facilities on an impervious base, within an area surrounded by bunds, secured by fencing. The base and walls of the embankment shall be impermeable and of sufficient capacity.

Spoils and surplus materials shall be transported using enclosed containers or covered trucks and shall be dumped in areas approved by the relevant authorities. Contractors shall prepare a spoils disposal plan prior to commencement of site works. When necessary, impervious liners, including walls and capping, shall be provided to prevent water from percolating through the waste materials and leaching toxic chemicals into the soil and groundwater.

During operation phase, the newly constructed track embankments may be damaged in rainy periods. Regular visual inspection for erosion damages on embankments shall be made and immediate repair works be carried out, as necessary.

The earthmoving and compaction requirements are likely to generate dust. The impacts associated with generated dust will only be significant where work is taking place close to residential or industrial areas. As the construction work of 700 m new branch line will take place in areas quite far away from the nearest inhabited areas, dust generation will not be a significant issue. But the distance from the unloading to the nearest inhabited area is very closed only few meters, so it will be a significant issue. In the loading area the air quality in

the region is still in good quality and the prevailing winds are likely to disperse the dust to acceptable levels before it reaches any receptor. Works taking place near unloading area will need to monitor the levels of dust being generated. In the event that dust from the construction activities is being deposited on the nearby houses and buildings the contractor will be required to implement dust control measures. These will include ensuring that diesel equipment is operated and maintained properly; reducing dust generation by reduced speed limits; and spraying water on work sites to suppress dust.

Once operational there will be no significant air quality impacts from the rail line. Diesel locomotives will be used to power the trains and so there will be some emissions from the engines. However the air quality of the region is good, there are no other sources of pollution close to the line and the prevailing winds will quickly disperse the emissions to acceptable levels.

Air quality measurements were conducted at eleven points along Railway Line Lahat to Kertapati before the project is started. South Sumatra Governor Regulation No.17/2005 in term of Ambient Air Quality, was used to determined whether the quality meets the minimum threshold value or not. In these samplings, it was measured some parameters which probably give impacts to the surrounding environment of the existing railway line Lahat-Kertapati. The parameters were: Temperature, CO, SO_x, NO_x, HC, and PM₁₀.

Based on existing environmental conditions along the track, ambient air quality along the railway line is in good condition and pollution concentrations are well below the National Ambient Air Quality Standards. Even though, mitigation measures shall be incorporated in the EMMP to address air and gaseous emissions. Those include ensuring that all machinery used in the construction works (especially diesel operated machinery) are always well maintained and in good condition, minimizing the idling time of such machinery, and ensuring that the mufflers of all used vehicles and machinery meet the required standards.

Applying best practices managements, in most cases should be able to reduce such impacts. It should also be mentioned that as the work progresses, more and more construction materials might be transported by rail, which will significantly reduce any emissions from trucks and other vehicles that would otherwise be used to transport such materials. Proper coverage of wagons shall be practiced in transporting materials.

The magnitude of the impacts on air quality by the Project will strongly be dependent on the mitigation measures to be taken. For example, in the event that dust and emissions caused by transport of construction materials, aggregate preparation, extraction of borrow materials (if any), and various site works such as uncontrolled burning of waste, the contractor will be required to implement dust control and air quality measures. These will include ensuring that diesel equipment is operated and maintained properly; reducing dust generation by reduced speed limits; and spraying water on work sites to suppress dust.

Other mitigation measures will include provision of dust control systems such as fabric filters or wet scrubbers for batching plants (if any are near the work sites). They will also include surface treatment or overlaying of diversion and haul routes with shingle and sprinkling water during dry periods, particularly in the vicinity of villages. This will help ensure that haul trucks

carrying aggregate fill materials are kept covered; and enforcing the regulation applicable to gaseous emissions for vehicles, equipment, and machinery.

During the operation period, if these facilities are expanded, it will raise problem, because the coal transportation from the mining field to loading facility using so many trucks passes will spread coal dust. However, planting and maintenance of trees along both sides of the track shall be undertaken to help further reduce the amount of particulate and gaseous emissions that may reach nearby settlements.

During the entire construction period, the Contractor shall guarantee that all river beds and drainage areas close to any of the construction sites will be maintained and in good condition. This includes preventive practices to avoid accidental and non-accidental disposal of materials and/or other particles originated by the works near those water resources.

During the operation period, no significant surface water pollution is expected. However, there is a concern about impacts that would arise from a possible derailment during the operational phase that could lead to oil and/or chemical spills. Proposed mitigating measures include imposing a lower running speed at those sections, and/or have oil spill containment/clean up plan and necessary equipment readily available.

The measures that are proposed to mitigate/restrict the impact on surface water also include restricting the disposal of excavated earth, grease, and oil in existing water sources, rivers, streams, and irrigation sub-canal. To protect surface water from oil and oil products penetration, proper working equipment and machinery shall be used. Drip boards and other protection will be considered for all specific places, for preventing water and humidity penetration. Work near irrigation canals will be kept to a minimum to avoid disrupting water supplies to croplands.

The Contractor shall comply with the requirements of current legislations in the field of water protection in regards to ensuring all necessary permits (for use of water and wastewater discharge), and take over administrative responsibility. Wastewater from machinery workshops at the construction sites and temporary workers camp sites will be treated using gravel and/or sand beds to remove oil and grease before it is discharged. The workforce will be trained on proper storage and handling of materials and chemicals. Work camps will be provided with pit latrines or septic tanks to handle sewage.

During the construction activities' phase, expected wastewater sources mainly entail domestic sewage from workers camps and staff quarters, and to a lesser extent industrial wastewater from washing of equipment and vehicles. In addition to strict and proper management of both liquid and solid waste at such locations, the workers camps will also adopt water-efficient practices and increase the awareness of workers to minimize the discharge of wastewater. The small quantities of domestic sewage from staff quarters will be discharged to local water sealed septic tanks and/or cesspools. For the permanent stations, it is recommended to utilize water tight reinforced concrete septic tanks (twin chambered for sedimentation and anaerobic treatment) with properly designed leach fields (with respect to both number and length) for the dual purpose of disposal of the anaerobic treated effluent and to irrigate the landscape in the station vicinity. The utilization of perforated piping system

of durable material is also recommended. No significant impacts are anticipated given the limited quantities and the nature of such waste.

The operation of plants and equipments during the construction of the rail line will generate noise and vibration. As the majority of the construction will be occurring many kilometers away from the nearest sensitive receptors any significant noise or vibration will be attenuated by the distance. Materials for the construction for the rail line will be bought to site by truck. This will include sleepers, rails and ballast. Truck movements have the potential to generate significant noise and vibration, particularly when passing through villages and towns.

In order to prevent any noise and vibration issues arising from truck movements the contractor will be required to develop haulage routes that ensure that any villages or towns are bypassed by trucks. Alternatively, the transportation of such materials could be used by train.

There are two locations where construction activities will be taking place close to villages; these are the construction of the rail crossing of the mine field Merapi 700 m length and the expansion of unloading facilities in the north end of Kertapati Station Area. No noise monitoring had been undertaken as part of this IEE but existing noise levels at both sites are expected to be low, reflecting the rural nature of the area and nearby a Musi River as wide as around 250 to 280 m. Railway noise from passenger train is the major noise source during the departure and arrival activities in Kertapati station, the distance is only few meters. However the contractor will be required to liaise regularly with both communities and in the event that there are night time noise impacts the contractor will be required to limit construction to the hours of 7am to 7pm. The new 700 m branch line is a few kilometers away from the nearest village so attenuation over distance will cause a significant reduction in noise levels.

For future maintenance works, PT. KAI should establish good relationships with communities and in the event that there are night time noise impacts the contractor will be required to minimize the amount of noise produced at night through previously mentioned mitigating measures. To minimize impacts, construction activities with noisy equipment near inhabited areas shall be scheduled to avoid certain hours. With such best engineering practices and management measures, no significant disturbance to the local communities from future maintenance activities is expected.

Typical of any railway construction of this scale, substantial quantities of waste are generated. Any hazardous materials that are used will need to be stored and handled correctly to prevent spills and pollution. In order to minimize the likelihood of spills and to ensure proper clean up if a spill occurs, several measures should be included in the Environmental Management and Monitoring Plan (EMMP). Those include storage of all hazardous wastes and hazardous materials, lubricating oil, solvents and fuels, within a designated area that has the capacity of at least 110% of the largest container in the storage area. Oil spill clean-up materials (sorbent pads, loose sorbent material, etc.) shall also be made available. Any spill or leak shall be addressed immediately and the contaminated soil and material be disposed appropriately.

The source of materials used in the construction works such as cement and ballast shall always be obtained from licensed facilities. It is important that trains hauling such materials are covered to minimize dust and other similar nuisances especially in the populated areas along the alignment.

The trains using the line are expected to carry bulk cargo, materials, wagons carrying bulk liquids, etc. The handling of bulk fuel carriers presents the risk of significant spills if not properly handled.

During the construction phase of the Project, many unskilled labors will be required. Employment opportunities for people with a low level of skills will increase the positive benefits for the local residents. Most of the unskilled labor should be recruited from local communities for the execution of the Project. Furthermore, indirect opportunities for employment and business will arise from the provision of services to the project team. In this sense, the Project may have a noticeable positive impact on the employment situation of the whole region. Moreover, opportunities for increased employment in the coal industry can be expected, especially in the operational stages of the Project.

The precise location of workers camps and other facilities, such as workshops for equipment, equipment washing yards, quarries, crushing areas (if any), material storage areas, haul routes, and disposal sites for waste, shall be determined in consultation with the Contractor. It is recognized that these facilities may cause vegetation loss and permanent physical and visual impacts, and pose pollution risks. Further, the site of workers camps has the potential to cause conflict with the local population if done without consideration for local tradition and customs. The influx of a number of non-local workers into a small rural community that is both religiously and socially conservative can lead to conflicts. The employment of local labor on the Project will go some way in decreasing such risks.

Workers camps shall, therefore, be sited well away from local communities and critical receptors such as settlements, schools, health facilities, and similar sites to minimize interactions between the workforce and the local populations. Moreover, locations with minimal vegetation will be considered when selecting sites for workers camps and other facilities and sites shall be located in non-productive barren lands, and publicly recognized waste lands. Such sites shall be selected on the basis of type of soil strata, depth of water table, ground topography, prevalent vegetation state, etc. They shall be prohibited where they might interfere with the existing or designed drainage pattern.

The Contractor will also ensure that measures will be implemented to guarantee the health and safety of workers and the public. This shall include fencing to avoid accidents, and properly draining them to avoid pooling of water that could harbor mosquitoes. Proper collection and disposal of solid and liquid wastes, as well as basic medical facilities and appropriate safety gear for the workers shall also be provided.

During operation phase, It shall considered that steel or concrete boundary walls as well as fences be developed to protect people from trains, to avoid people from trespassing on the tracks, and to separate people from the railway line.

Additionally, people are not allowed to construct their houses and factories near the right of way. The municipal administration will be made responsible through legislation that if any

structure is built along the railway line, its doors/gates shall not be allowed to face the railway line. The railway authorities shall be empowered to take action against such cases. This will substantially help in reducing the number of accidents and the tendency of establishing uncontrolled/un-manned crossings will also be reduced. In this respect, an awareness campaign is recommended to teach people about safety on and around the railways, and to teach them to use over and under passes and only cross the line at railway crossings.

There is historical place importance located nearby the unloading facility of PT. BAU in Kertapati District of Palembang that is Ki Merogan mosque. The distance is only about 25 m from the stockyard of PT. BAU. This mosque is the second oldest mosque built in Palembang, after the Agung Mosque and one of the most visited mosques by pilgrims. Given the distance from the expansion plan of unloading facilities of PT. BAU and the mild nature of the construction activities, negative impacts are unlikely to happen.

It seems very difficult to expand the area for unloading facilities around the area of existing unloading facilities because of limitation area. PT. BAU is located between PT. BA coal stockyard and Ki Merogan Mosque). The coal shipment should be managed very well, so the problems of limitation area for coal stockyard can be avoided.

Land acquisition and resettlement for loading-unloading areas may take places in Merapi in Lahat Regency and Kertapati District in Palembang City respectively. Especially at unloading area in Kertapati is categorized as densely populated area.

5. Institutional Requirements and Environmental Monitoring Plan

Relevant Organizations and Responsibilities for Environmental Aspects are Ministerial of Environment (KLH), Directorate General of Railways, Ministerial of Transportation, Regional Environmental Agency (BLH) Province or Regency/ City, and other related institutions which are either government or private agencies at central and regional levels.

Mostly railway projects in Indonesia were implemented by the Directorate General of Railways (DGR) of Ministry of Transport. The main implementing organization for operation will be PT. KAI under the Directorate General of Railways (DGR).

Environmental monitoring is a vital tool to be used during the construction works and operation stages of the Project. This will ensure safeguarding the protection of the environment and to ascertain that the negative environmental impacts can be controlled and mitigated effectively. Again, given that the operational phase is expected to have environmental impacts (especially with the improved operation, higher train volumes, and higher operating speeds), a detailed EMMP is required.

6. Public Consultations

Public consultation is required to provide information to the public, especially groups of people who may be impacted due to rail way construction in the region. It is very important to their aspirations in the form of opinions, proposals and suggestions for consideration in the planning process or a network of railways to be constructed / upgraded. This public

consultation is a forum of community involvement in the planning process, and hopefully as the social impact of prevention efforts as early as possible.

7. Finding and Recommendation

The IEE shows that no major negative environmental impacts are expected as a result of (1) Increasing transport capacity (5 MTPA); (2) Increasing number of train into 8 train per day; (3) Extending track effective length (about 665 m = 615 m + 50m) at some sections; (4) complete the double tracking work between Muara Enim and X6, (5) the addition of two signal stations, (6) construction of branch line of 700 m from Merapi to main line, (7) construction of stockyard and unloading facility in the north end of Kertapati station area and; (8) capacity expansion of depot, if these projects are conducted following environmental regulations carefully.

The Project will have some minor environmental impacts, which will be both positive and negative, including: (a) soil erosion, (b) effects on noise and air quality due to the expansion works and operation activities; (c) increased growth in the economy of the region; (d) income and employment opportunities; and (e) reduced poverty.

Implementation of appropriate mitigation measures during the expansion works and operation phases will minimize the negative impacts of the Project to acceptable levels.

To ensure that these mitigation measures are implemented and negative impacts avoided, the measures shall be incorporated in the operational phase. Environmental monitoring of the Project will be undertaken regularly throughout the entire stages of its operation to ensure that the measures are being implemented properly.

8. Conclusions

The Project activities will have both positive and negative impacts to the environment. The IEE findings clearly show that the Project will have socioeconomic benefits. If the prescribed mitigation and management measures are fully implemented, it is unlikely to have significant adverse environmental impacts. An environmental management and environmental monitoring plan should be prepared for implementation assigned.

[Appendix 10-1-5] Summary of Draft AMDAL for the 3rd Stage

**EXECUTIVE SUMMARY
ENVIRONMENTAL IMPACT ASSESSMENT
(AMDAL)**

**CAPACITY EXPANSION OF RAILWAY LINE
LAHAT – KERTAPATI
SOUTH SUMATRA - INDONESIA**



Drafted by:

PPLH UNIVERSITAS SRIWIJAYA



Jalan Raya Palembang – Prabumulih Gedung Perpustakaan Kampus Unsri Km. 32

Inderalaya Ogan ilir 30662

Telp/Fax. (0711) 355805 / 580640,

email : pplh.unsri@gmail.com



PALEMBANG, MARCH 2012

CHAPTER 1 INTRODUCTION

1.1. Background

Priority areas of infrastructure development of national transport in 2010 - 2014 are; (1) to ensure the availability of basic infrastructure to support the improvement of welfare, with a focus on improving services and infrastructure facilities in accordance with minimum service standards (MSS) and; (2) to ensure the smooth distribution of goods, services and information in order to improve competitiveness of national products, with focus on: (i) support the improvement of competitiveness of the real sector and (ii) enhance public-private-partnership (PPP).

Moreover, viewed from all sides, rail transportation is a highly competitive and efficient in energy consumption, noise, CO₂ emissions, and more environmental friendly than highway modes. Indonesia already has the new legal instrument for national railways. Indonesian Railways Act Number 23 Year 2007 and Government Regulation Number 56 Year 2009 and Number 72 Year 2009 have given way for the reconstruction of railways Indonesia massively and rapidly. Railways in Indonesia is no longer a monopoly by the state and therefore the construction can be carried out jointly or separately by the government, local governments, state enterprises, enterprises, and private sector.

PT. KAI is one of the state-owned companies engaged in land transport, namely rail. PT. KAI operates trains in the Province of Aceh, North Sumatra, West Sumatra, South Sumatra and Lampung, also all provinces in Java. Overall length of railways in Indonesia is 7583 kilometers. More than 2500 kilometers of track had been closed; most of the branch lines that are not considered profitable when it is used. In operation, PT. KAI assisted by the 9 areas of operation, which consists of three regional divisions and two regional subdivisions scattered throughout the operation.

In one hand, most of existing conditions of the railway network are old and over capacity, especially for Lahat – Kertapati line. On the other hand the railway network services is increasing. So, railway network requires the additional railway line to solve the problem in order to enhance regional economic growth, especially in terms of transportation services of people, goods and market of product in South Sumatra.

In Coordinating Meeting Sumatran Governor in Palembang, July 28th, 2011, Minister of Energy and Mineral Resources affirmed Sumatran strategic position as “*Sentra Produksi dan Pengolahan Hasil Bumi dan Lumbung Energi Nasional*” (Production and Processing Center for Agricultural Products and National Energy Barn) in Master plan of Acceleration and Expansion of Economic Development Indonesia (MP3EI) 2011-2025, which leads Indonesia to become one of top 10 in the world’s economic power.

To achieve this, investment opportunities in the energy sector are wide opened by South Sumatra Province, particularly coal mining. In order to exploitation of coal reserves optimally, required support a reliable coal transportation network with a large payload capacity, low transportation costs, and efficient, as well as environmentally friendly and does not interfere with passenger traffic.

Limited capacity of transport networks in South Sumatra are causing the investment process for exploitation of coal resources to be hampered, because it is difficult guaranteed that the products can reach the port on time.

To ensure the implementation of the development of the national transportation network and ensuring the smooth distribution of goods and services in accordance with the priority directions of development of national transport infrastructure, especially local transport, PT. KAI Regional Division III South Sumatra has planning to expand railway line, Lahat-Kertapati.

To support this, PT. KAI plans to develop whole double tracking work from Lahat to Kertapati with target transportation capacity 10.0 MTPA (Million Ton Per Annum). The double tracking development may have positive impacts on regional development and increased economic activity. But besides the positive impact generated, it can have negative impacts on the environmental components such as air quality degradation and increased noise during construction and operation of railways.

1.2. Scope of Project

The third stage project of Capacity Expansion of Railway Line Lahat-Kertapati includes: (1) increasing transport capacity to 10.0 MTPA; (2) increasing number of train per day will be 12 trains; (3) extension of track effective length to 980 m (930 m of trains length, 3 loco + 60 freight wagons) + 50 m safety; (4) whole double tracking work between Lahat-Kertapati railway line, exclude track between Muara Enim and X6, (5) introduction of electric signalling system (6) development of coal stockyard in Kertapati station area of 20 ha and installation of belt conveyor system to reach Musi River and; (7) capacity expansion of depot. See Figure 2.1 for the scope of third stage project of Lahat-Kertapati railway line capacity expansion.

The project study area encompasses 3 regencies; Lahat, Muara Enim, Ogan Ilir and 2 cities; Prabumulih and Palembang in South Sumatra Province.

Project Activities could be divided into four stages, as follows:

- Pre-Construction Stage

- a) Survey and measurement
- b) Land acquisition

- Construction Stage

Construction stage activities that predicted will produce significant impacts are:

➤ *Work Preparation:*

- a). Mobilization of heavy equipment
- b). Mobilization of manpower
- c) Construction and operational of the base camp

➤ *Implementation*

- a) Land clearing and preparation of sub grade
- b) Transportation of soil and construction materials
- c) Quarrying and stocking piling works
- d) Drainage Works
- e) Bridge construction works
- f) Underpass/ Overpass (UP/OP) works
- g) Construction Transient Stations

• Operation Stage

- a) Operation of Coal Transportation

Operation Capacity expansion of railway line Lahat-Kertapati Lahat of South Sumatra Province, will be conducted as follows:

- 1) **Phase 1 – Step 1** target of 2.5 MTPA will require 8 trains /day, each train consist of 1 loco + 25 freight wagon. Running speed is 65 km/h.
- 2) **Phase 1 – Step 2** target of 5.0 MTPA will require 10 trains /day, each train 1 train consist of 2 loco + 40 freight wagons. Running speed is 65 km/h.
- 3) **Phase 2** target of 10.0 MTPA will require 12 trains /day, each train consist of 3 loco + 60 freight wagons. Running speed is 65 km/h.

- b) Maintenance of Railways
 - 1) Routine maintenance
 - 2) Periodic maintenance

• Post Operation Stage

- a) Labor Management
- b) Assets Management

Environmental impact analysis will conduct parallely with the Pre-Feasibility Study. There is no alternatives of location/alignment for this project. The capacity expansion of railway line Lahat-Kertapati will not intent to make a new line with a new area. This project intents to double tracking from existing single track side by side

Based on the environmental impact analysis (EIA), there are some components that are environmentally significant impacts resulting from the project planned. Based on the holistic study as a basis for the management, some of these impacts can be managed. The estimated negative impact can be avoided and / or mitigated while the positive impacts can be optimized and / or enhanced. With the availability of various impact management approaches, the project are considered **environmentally viable**

CHAPTER 2 SIGNIFICANT IMPACT

Based on the results of impact evaluations, there are a number of significant impacts that are the primary effects and significant impact is the impact of derivatives. If the primary impacts can be managed or controlled, the impact of derivatives will also be controlled. Significant impacts that are classified as primary impact of the project, among other things:

- 1) Public unrest
- 2) Noise
- 3) Decrease in Air Quality
- 4) Decrease in Surface Water Quality
- 5) Impaired flow of surface water (run-off and erosion)
- 6) Vibration
- 7) Disturbance Vegetation and Wildlife
- 8) Changes in Livelihoods
- 9) Employment and Requirements
- 10) Accessibility of Population
- 11) Traffic Accidents
- 12) Disorders Utilities

I

As an environmental component that received the most impact activity, restlessness people need to be managed wisely and carefully. Direction of the impact on these components can be positive or negative impact depending on the actions of management and / or mitigation activities performed at each stage, especially during the land acquisition activities are very important both for people and for the continuation of the activity plan / project as a whole. Failure of the management of public unrest components can inhibit the success of the project planned; given that component is also an accumulation of impacts on other environmental components.

Judging from the impact on air quality, although of the six components, only two activities that cause significant negative impacts, however, if accumulated, it will be significant negative impacts. Dust / TSP and NO_x of at a critical parameter in the construction phase and operation phase that needs to be managed properly so that negative impacts will be reduced to a minimum.

Noise is also a significant environmental component to get the appropriate management action. Utilization of space belongs to the rail (*rumija*) and control space of rail (*ruwasja*) should be utilized as maximum as possible so that the impact of noise can be reduced to a minimum.

CHAPTER 3

ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

Based on the evaluation of significant impacts in the EIA documents, there are both positive and negative impacts are expected to be incurred in connection with these activities include:

- 1) The components of space and bio-physical-chemical form of: reduced air quality, increased noise, decreased quality of surface water, surface water flow disturbance, disturbance of vegetation and wildlife, and the hazardous and toxic waste (hazardous and toxic materials).
- 2) Components of social-economic-culture and public health: problems of accessibility, congestion / traffic accidents, road damage, utility disruption, social unrest, the opportunity to work and strive, economic activity and public health.

Not all impacts of the proposed business or activity and the construction of the railway alignment as mentioned above should be managed, but only an estimated impact of major importance. The resume of Environmental Management Plan is described in Table 1.

Further action plans should be formulated for environmental monitoring as a guide the proponent to see changes in environmental conditions surrounding.

The purpose of monitoring plan is intended to monitor the implementation of important positive and negative impacts of the project. PT. KAI is carried out plan activities / business through the best management principles and environmentally sound development in order to realize a sustainable development policy.

The purpose of this monitoring, among others, to define the components of the affected environment to be monitored, particularly the significant impacts that have been agreed in the EIA study and has proposed management plan and provides an implementation process in order to serve as guidelines in managing the proper environment, so negative impacts can be kept to a minimum and the positive impact can be maximized. The resume of Environmental Monitoring Plan is described in Table 2.

Table 1
Matrix of Environmental Management Plan for the Capacity Expansion of Railway Line, Lahat-Kertapati in South Sumatera

No	Environmental components are monitored	Source of Impact	Benchmark	Management objectives	Environmental Management Plan			Institutional Management		
					Management efforts	Management location	Management period	Executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11
PRE-CONSTRUCTION PHASE										
1	public unrest	Survey / Measurement	Public Perception	Anticipating public unrest around the location of activities	Anticipating public unrest around the location of activities Provide information to the community action plan	Village / District / County / City is traversed by the railway alignment	At the time of survey and measurement (before construction begin)	PT. KAI	BLH Provinsi BLHD Lahat BLHM, Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang BPN Kades/Camat	BLH Provinsi BLHD Lahat BLHM, Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang BPN Kades/Camat
		Land Acquisition	Publics complaints Province's Sumatra. Regulation No 25/2009	Anticipating unrest communities around the location of activities Anticipating a surge in land prices is not fair	Pricing a consensus agreement by taking into account regulations Involving government officials (Head / Kades / BPN) in the process of land acquisition Socialize the land acquisition plan to the public / landowners	Village / District / County / City is traversed by the railway alignment	Before construction begins			
		Socialization	public perception	Anticipating public unrest around the location of activities Provide information to the community action plan	Outreach to the community about the development activities planned development of a railway station-Lahat Kertapati	Village / District / County / City is traversed by the railway alignment	Before construction begins			

No	Environmental components are monitored	Source of Impact	Benchmark	Management objectives	Environmental Management Plan			Institutional Management		
					Management efforts	Management location	Management period	Executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11
CONSTRUCTION PHASE										
2	public unrest	Labor Mobilization	Local workforce is absorbed	Anticipating public unrest around the location of activities	Prioritize local labor Information dissemination and provision of information to the public about employment and qualifications required	Village / District / County / City is traversed by the railway alignment	At the time of initial construction phase	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Disnaker Kades/Camat	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
3	Increasing Employment Opportunities and Business		The total number of workers absorbed	Providing employment opportunities and business primarily to the local labor	Providing information about their qualifications, expertise and manpower needed by the project Provide local employment training	Village / District / County / City is traversed by the railway alignment	At the time of initial construction phase			
4	damage to roads	mobilization of Equipment Transport of soil and Material	Road conditions	To avoid damage to roads caused by the activities of the project equipment mobilization	Repair roads damaged by the mobilization of project equipment Restrict or limit the tonnage of the equipment of the vehicle axle pressure equipment transporters In cooperation with Public Works Highways in the repair / pavement	County roads and / or rural roads that crossed paths mobilization and transport equipment around the project site	During the construction phase	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Dinas PU Dishub	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang

No	Environmental components are monitored	Source of Impact	benchmark	Management objectives	Environmental Management Plan			Institutional Management		
					Management efforts	Management location	Management period	Executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11
CONSTRUCTION PHASE										
5	Accessibility disorders	<ul style="list-style-type: none"> Land clearing and preparation of subgrade Work rail structure Bridge Construction Work Development of the Stockpile and Belt Coveyor 	No negative public perception due to the disruption of access	Public accessibility is not distributed so that it can carry out activities	<p>Making overpass / bridge on the other side of the locations are often impassable population / plot trajectories</p> <p>Installation of traffic signs</p> <p>Traffic regulation</p>	Project site (trace railway lines) and location of Stockpile	During the construction phase, when the activity causing the impact	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Dishub	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
6	Congestion / traffic accidents	Transport of soil and material	Traffic conditions and accidents at crossings plot	Reduce congestion and the risk of traffic accidents	<p>Making overpass / bridge on the other side of the locations are often impassable population / plot trajectories</p> <p>Installation of traffic signs</p> <p>Traffic regulation</p>	State roads / district through which the railway alignment	During the construction phase, when the activity causing the impact			
7	Utility interruption	Land clearing and preparation of subgrade Bridge construction Stockpile Development and Belt Coveyor	condition of utility	Retain / maintain public utilities from being damaged / impaired function	<p>Of moving utilities or utility repairs if something is broken / interrupted.</p> <p>Notice to the local community about the possible disruption of utilities</p>	Project site (rail alignment)	During the construction phase, when the activity causing the impact	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Camat/Lurah	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang

No	Environmental components are monitored	Source of Impact	benchmark	Management objectives	Environmental Management Plan			Institutional Management		
					Management efforts	Management location	Management period	Executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11
CONSTRUCTION PHASE										
8	Decrease of Air Quality	<ul style="list-style-type: none"> Land clearing and preparation of subgrade ground transportation and material Work excavation and pile Work rail structure Bridge Construction Work Development of the Stockpile and Belt Coveyor 	Air quality still under Sumatra Province's Regulation No. BML. 17 of 2005	Controlled air pollutants, particularly dust parameter (TSP)	<p>Conduct regular watering especially during dry conditions / no rain</p> <p>Back of trucks covered with tarpaulins</p> <p>Maintaining vegetation and / or immediate revegetation in areas that have not / do not use (eg. 2.5 m width + left-right on the road supervision space)</p> <p>Use of equipment / machinery / construction of transportation that meets vehicle emissions standards</p>	Project site (rail alignment)	During the construction phase, when the activity causing the impact	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
9	Increased Noise	<ul style="list-style-type: none"> Land clearing and preparation of subgrade ground transportation and material Work excavation and pile Work rail structure Bridge Construction Work Development of the Stockpile and Belt Coveyor 	The noise level was still fulfill Threshold LH No Candy. 48 of 1996	<p>Controlled air pollutants, particularly dust parameter (TSP)</p> <p>To avoid hearing loss harmful to the health of workers and the public</p>	<p>Maintaining vegetation and / or immediate revegetation in areas that have not / do not use (eg. 2.5 m width + left-right on the road supervision space)</p> <p>Use of equipment / machinery / transport that meets the standards of construction noise levels</p> <p>Perform engine maintenance / construction equipment at regular intervals</p> <p>Replacing the silencer / sound suppressor on the engine / generator to reduce noise levels</p> <p>Workers / operators use protective equipment (ear plugs)</p> <p>Socializing / notification to the community near the project site</p> <p>Adjusting work schedules to reduce the exposure time to the worker / recipient community noise impact</p>	Project site (rail alignment)	During the construction phase, when the activity causing the impact			

No	Environmental components are monitored	Source of Impact	benchmark	Management objectives	Environmental Management Plan		Institutional Management			
					Management efforts	Management location	Management period	Executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11
CONSTRUCTION PHASE										
10	Reduction in surface water quality	Operation basecamp and Stockpile	Still meet water quality LH Decree No. BML. 112/2003 about Domestic Waste Water Quality Standards	Unbridled liquid waste, particularly water from domestic activities in basecamp	Controlling domestic wastewater Creating a septic tank to accommodate the domestic wastewater at basecamp Distanced from the stockpile of operational locations along the river (at least 100 m) Making a temporary levee or drainage channels to control run-off	basecamp location Alignment rail line that cuts a few rivers and creeks, along Lahat-Kertapati		PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
11	Reduction in surface water quality	<ul style="list-style-type: none"> Land clearing and preparation of subgrade Work excavation and pile Drainage Works Bridge Construction Work Development of the Stockpile and Belt Coveyor 	Still meet water quality Sumatra Province's Regulation No. BML. 16 of 2005 Threshold values of erosion <15 tonnes / ha / year	Unbridled wastewater, especially TSS parameter	Maintaining vegetation and / or immediate revegetation in areas that have not / do not use (eg. 2.5 m width + left-right on the road supervision space)					
12	Interruption in the flow of surface water (run-off and erosion)		Still meet water quality Sumatra Province's Regulation No. BML. 16 of 2005 Threshold values of erosion <15 tonnes / ha / year	Controllable surface water flow and erosion Reduced negative impact of aspects of the land around the project site so as not to increase the erosion	Maintaining vegetation and / or immediate revegetation in areas that have not / do not use (eg. 2.5 m width + left-right on the road supervision space) Preparation of the embankment or the channel / drainage systems to control run-off		During the construction phase, when the activity causing the impact			
13	Disturbance of vegetation and wildlife	Land clearing and preparation of subgrade	The number of species and plant density The number of species protected by Regulation No. 7/1999 about the preservation of plants and animals	Maintaining the number of species / variety of plants as an advocate for wildlife habitat	Maintaining vegetation and / or immediate revegetation in areas that have not / do not use (eg. 2.5 m width + left-right on the road) Put up a bulletin board / appeals to avoid felling trees and pleading not to shoot or hunt wildlife along the railway track alignment (project site)	Project site (rail alignment) along Lahat-Kertapati				

No	Environmental components are monitored	Source of Impact	benchmark	Management objectives	Environmental Management Plan			Institutional Management		
					Management efforts	Management location	Management period	Executive	Supervisor	Reporting
1		3	4	5	6	7	8	9	10	11
OPERATION STAGE										
14	Congestion and traffic accidents	Rail Operation Stockpile and Belt Operation Coveyor	Traffic conditions and accident	Reduce congestion and the risk of traffic accidents	Installation of traffic signs Traffic regulation Make the crossing guard post on a plot of	State roads / district through which the railway alignment	During the operation phase	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
15	Accessibility of Population		There are no complaints The number of illegal crossings	Public accessibility is not disturbed	Making overpass / bridge on the other side of the locations are often impassable population / plot trajectories Installation of traffic signs Make the crossing guard post on a plot of					
16	Decrease in air quality		Sumatra Province's Regulation No. 17 year 2005	Controllable parameters of air pollutants, especially NO _x , SO ₂ , CO and dust (TSP)	Planting / reforestation in ruwasja Perform periodic maintenance on the locomotive / train transport	Project site (rail alignment) along Lahat-Kertapati				
17	Increase in noise		Environmental Ministry Regulation No. 48 year 1996	The noise level does not cause damage or loss of health problems	Planting / revegetation which can be useful to reduce noise (eg, 2.5 m width + left-right on ruwasja) Make a noise barrier, especially at locations adjacent to settlements. Using the rails and ballast material, which can reduce noise					
18	Hazardous waste		PP 18/1999 about Waste Management Hazardous and PP 85/1999 about the Amendment to PP 18/1999	To minimize the possible impact of pollution by waste HAZARDOUS	1) Create a temporary shelter (TPS) for the Hazardous Waste Collection points and temporary shelters 2) Submit Hazardous Waste to a third party who has had a Hazardous waste management license 3) Create and implement Standard Operating Procedures (SOP) Hazardous Waste Management on all aspects of 4) Increasing human resource capacity through the Course/Training Hazardous Waste Management	TPS Hazardous Waste Depot Waste Depot in Station Maintenance Load (loading station)				

No	Environmental components are monitored	Source of Impact	benchmark	Management objectives	Environmental Management Plan			Institutional Management		
					Management efforts	Management location	Management period	Executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11
POST- OPERATION STAGE										
19	Livelihood Changes	Workforce Management Asset and facilities management	public perception	Increase the positive public perception of the company	The release of the working relationship wisely and in accordance with applicable regulations Briefing / training to employees (as part of the program CD / CSR). In cooperation with the Director General of Railways Kemhubinfo and in asset management and facilities	Villages in the Footprint Project (rail alignment)	Post-Operation phase	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Disnake, Kemhubinfo, Kades/Camat	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
20	Employment opportunities and business		Socio-economic conditions of the population	In order for socio-economic conditions of the population affected by the project has not changed drastically	Release of employment should be done wisely and in accordance with applicable regulations Training to employees (as part of the program CD / CSR).					
21	economic activity		Socio-economic conditions	Not change drastically the economic activity at the regional / local	The release of the working relationship wisely and in accordance with applicable regulations Training to employees (as part of the program CD / CSR).					

Table 2.
Matrix of Environmental Monitoring Plan of Capacity Expansion of Railway Line, Lahat-Kertapati in South Sumatra

No	Environmental components are monitored	Source of Impact	Monitoring objectives	Environmental Monitoring Plan			Institutional Monitoring				
				Benchmark	Data collection methods	Monitoring locations	Duration and Frequency	Method of Analysis	Executive	Supervisor	Reporting
1	public unrest	3	4	5	6	7	8	9	10	11	12
PRE-CONSTRUCTION PHASE											
1	public unrest	Survey / Measurement	Knowing the level of social unrest that can be input in the action / social aspects of management efforts	public perception	Interviews and questionnaires	Village / District / County / City is traversed by the railway alignment	pre-construction periode	Tabulation of data, comparison and analysis of the causative	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
		Land Acquisition	anticipation of soaring land prices are not reasonable	Complaints South Sumatra Governor Regulation No. 25/2009	Interviews and questionnaires	Village / District / County / City is traversed by the railway alignment	pre-construction periode	Tabulation of data, comparison and analysis of the causative	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
		socialization	Ensure that the public obtain accurate information about planned activities	Public Perception	Interviews and questionnaires	Village / District / County / City is traversed by the railway alignment	pre-construction periode	Tabulation of data, comparison and analysis of the causative	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang

No	Environmental components are monitored	Source of Impact	Monitoring objectives	Environmental Monitoring Plan			Institutional Monitoring				
				Benchmark	Data collection methods	Monitoring locations	Duration and Frequency	Method of Analysis	executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11	12
CONSTRUCTION PHASE											
2	public unrest	Labor Mobilization	<ul style="list-style-type: none"> Ensure that the negative impact of social unrest can be minimized 	Local labor is absorbed	Interviews and questionnaires	Village / District / County / City is traversed by the railway alignment	2 x in the construction period (early and late stages of construction)	Tabulation of data, comparison and analysis of the causative	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih, BLH Palembang Disnaker	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
3	Increasing Employment Opportunities and Business		Knowing the amount of labor absorbed	The total number of workers employed	Interviews and questionnaires	Village / District / County / City is traversed by the railway alignment	2 x in the construction period (early and late stages of construction)	Tabulation of data, comparison and analysis of the causative	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih, BLH Palembang Disnaker	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Palembang
4	damage to roads	<ul style="list-style-type: none"> Mobilization of Equipment Transportation and Material ground 	Ensure that management actions to the impact of road damage has been done	road conditions	Observations and secondary data	County roads and / or rural roads that crossed paths mobilization and equipment transport	2 x in the construction period (early and late stages of construction)	Tabulation of data, comparison and analysis of the causative	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Dinas PUBM	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang BLH Palembang

No	Environmental components are monitored	Source of Impact	Monitoring objectives	Environmental Monitoring Plan			Institutional Monitoring				
				Benchmark	Data collection methods	Monitoring locations	Duration and Frequency	Method of Analysis	executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11	12
CONSTRUCTION PHASE											
5	Accessibility disorders	<ul style="list-style-type: none"> Land clearing and preparation of subgrade Work rail structure Bridge Construction Work 	The accessibility community is not disturbed so that it can carry out activities	No negative public perception due to the disruption of access	Interviews and questionnaires	Project site (rail alignment)	2 x in the construction period (early and late stages of construction)	Tabulation of data, comparison and analysis of the causative	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Dishub Prov/Kab	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
6	Congestion / traffic accidents	<ul style="list-style-type: none"> ground transportation and material 	Knowing the conditions and level of traffic accidents	Traffic conditions and accidents at crossings plot	Interviews and questionnaires	Project site (rail alignment)	2 x in the construction period (early and late stages of construction)	Tabulation of data, comparison and analysis of the causative	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Dishub Prov/Kab	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
7	utility interruption	<ul style="list-style-type: none"> Land clearing and preparation of subgrade Bridge Construction 	Knowing the level of disruption to the utility	condition of utility	Interviews and questionnaires	Project site (rail alignment)	2 x in the construction period (early and late stages of construction)	Tabulation of data, comparison and analysis of the causative	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Dinas PU BM	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang

No	Environmental components are monitored	Source of impact	Monitoring objectives	Environmental Monitoring Plan			Institutional Monitoring				
				Benchmark	Data collection methods	Monitoring locations	Duration and Frequency	Method of Analysis	Executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11	12
CONSTRUCTION PHASE											
8	Decrease of Air Quality	<ul style="list-style-type: none"> Land clearing and preparation of sub grade ground transportation and material Work excavation and piling railway structure works Bridge Construction Work 	<ul style="list-style-type: none"> controlled water pollutants, particularly dust parameter (TSP) 	South Sumatra Governor Regulation No. 17/2005	Sampling and lab analysis	<ul style="list-style-type: none"> Footprint of the project: Location of Loading Station, Settlements Location of Unloading Station (Stockyard Kertapati) 	2 x in the construction period (early and late stages of construction)	Gravimetric, Saltzman, Pararosanilin or other appropriate methods and parameters applicable SNI	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
9	Increased Noise	<ul style="list-style-type: none"> Land clearing and preparation of subgrade ground transportation and material Work excavation and pile Work rail structure Bridge Construction Work 	Controlled air pollutants, particularly dust parameter (TSP) To avoid hearing loss harmful to the health of workers and the public	Decree MoE No. 48 of 1996	Observations and sampling	Same with air quality monitoring points	2 x in the construction period (early and late stages of construction)	Direct measurement of the Sound Level Meter	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang

No	Environmental Monitoring Plan				Institutional Monitoring						
	Environmental components are monitored	Source of Impact	Monitoring objectives	Benchmark	Data collection methods	Monitoring locations	Duration and Frequency	Method of Analysis	Executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11	12
CONSTRUCTION PHASE											
10	Reduction in surface water quality	Operation basecamp	Ensure the controlled liquid waste, particularly domestic wastewater from basecamp	Decree MoE No. 112/2003 about Domestic Waste Water Quality Standards	Sampling of surface water bodies and lab analysis	Basecamp and receiving water bodies closest to the basecamp	2 x in the construction period (beginning and end)	Gravimetric, titrimetric, and other methods appropriate spectrofotometry parameter	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
		Land clearing and preparation of subgrade	Governance measures to ensure the controlled liquid waste, in particular the parameters of TSS have been made	South Sumatra Governor Regulation No. 16/2005 about water quality I South Sumatra	Sampling of surface water bodies and lab analysis	Alignment rail line that cuts, S. Lematang, S. Musi	2 x in the construction period (beginning and end)	Gravimetric, titrimetric, and other methods appropriate spectrofotometri parameter	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
11	Interruption in the flow of surface water (run-off and erosion)	Land clearing and preparation of subgrade	Ensure the controlled erosion and surface water flow	South Sumatra Governor Regulation No. 16/2005	Sampling of surface water bodies and lab analysis	Alignment rail line that cuts, S. Lematang, S. Musi	2 x in the construction period (beginning and end)	USLE (erosion) Gravimetric (TSS)	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
		excavation and pile	Knowing the level of erosion and the amount of TSS	Threshold values of erosion <15 tonnes / ha / year							
12	Disturbance of vegetation and wildlife	Land clearing and preparation of subgrade	Knowing the number of species / variety of plants as an advocate for wildlife habitat	The number of species and plant density, number of species protected by Regulation No. 7/1999 about the preservation of plants and animals	Observations and sampling	Project site (rail alignment)	2 x in the construction period (beginning and end)	Analysis of vegetation (number of species and density) Inventory of wildlife species	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang

No	Environmental components are monitored	Source of Impact	Monitoring objectives	Environmental Monitoring Plan				Institutional Monitoring			
				Benchmark	Data collection methods	Monitoring locations	Duration and Frequency	Method of Analysis	Executive	Supervisor	Reporting
1	2	3	4	5	6	7	8	9	10	11	12
CONSTRUCTION PHASE											
13	Decrease in air quality	Operation and Maintenance of Rail	Knowing the level of air pollution and ensure controllable parameters of air pollutants, especially NOx, SO2, CO and dust (TSP)	South Sumatra Governor Regulation No. 17/2005	Observations and sampling	Project site (rail alignment) at the same point as the construction phase	2 times a year in operating periode	Gravimetric, Saltzman, Parosanilin or other appropriate methods and parameters applicable SNI	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
14	increase in noise		Knowing the noise level at this stage of the operation so as not to cause hearing damage or health problems	Decree MoE No. 48 year 1996	Observations and sampling	Project site (rail alignment) at the same point as the construction phase	2 times a year in operating periode	Direct measurement of the Sound Level Meter	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
15	Hazardous waste		To ensure that the hazardous waste does not cause pollution	Government Regulation 18/1999 Government Regulation 85/1999 KepBapedal No 1 sd 5 tahun 1995	Observations	Depot of Maintenance	1 x times a year in operating periode	Tabulation of data and comparison	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLHPalembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLHPalembang
16	Congestion and traffic accidents		Knowing traffic conditions and level of traffic accidents	Traffic conditions and accident	Observations	State roads / district through which the railway alignment	1 x times a year in operating periode	Tabulation of data and comparison	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir Dishub Provinsi/Kab	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih
17	Accessibility of Population		Ensure that public accessibility is not compromised	There are no complaints The number of illegal crossings	Observations and sampling	Project site (rail alignment), the location of crossing road	1 x times a year in operating periode	Tabulation of data and comparison	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLHPalembang	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLHPalembang

No	Environmental components are monitored	Source of impact	Monitoring objectives	Environmental Monitoring Plan			Institutional Monitoring				
				Benchmark	Data collection methods	Monitoring locations	Duration and Frequency	Method of Analysis	Executive	Supervisor	Rreporting
1		3	4	5	6	7	8	9	10	11	12
STAGE POST-OPERATION											
18	Public unrest	Labor Management Asset and facilities management	Knowing the level of social unrest that could be done actions / efforts for better management	public perception	Interviews and questionnaires	Villages along the rail alignment	1 x in the post operation period	Tabulation of data and comparison	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Disnaker	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
19	Employment opportunities and business		Knowing the amount of labor that will be released	Socio-economic conditions of the population	Interviews and questionnaires	Villages along the rail alignment	1 x in the post operation period	Tabulation of data and comparison	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Disnaker	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang
20	economic activity		Knowing the changes in economic activity regional / local	Socio-economic conditions of the population	Interviews and questionnaires	Villages along the rail alignment	1 x in the post operation period	Tabulation of data and comparison	PT. KAI	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang Kemhubinfo	BLH Provinsi BLHD Lahat BLH M. Enim BLH Ogan Ilir BLH Prabumulih BLH Palembang



PUSAT KOPERASI KARYAWAN KERETA API (PUSKOPKA)

DIVISI REGIONAL III SUMATERA SELATAN

Badan Hukum : Nomor 4031/BH/VII/KOP/VI/2011
Jalan Jend. A. Yani No. 541 Plaju - Palembang



[Appendix 10-1-6] Minutes of Discussion

MINUTES OF MEETING AT KERTAPATI AREA

Day/Date : Friday, January, 27. 2012
Place : Kertapati Sriwijaya Boarding
Time : 09.00 – 10.30 am
Ceremony : Socialization of Double Track is with Kertapati People

A. Chief of ceremony are Mr. Sutrisno as Moderator, Mr. Jaka Jarkasih, S.T as Public Relation of PT. Kereta Api Indonesia, Mrs. Indarti Oktaria, S.E as Secretary, and Mr. Bogo Abe as Chief of Survey and Mr. Gema Ksatria, S.Sos.I as Interpreter

B. Content of Meeting

People attended about 30 persons and some of people asked about project. The meeting divided two part. They are;

1. Part. 1, there are five persons such as;

a. Mr. Emer (Chief of RW. 07 RT. 35 of Kertapati Area)

1) What's purpose of this project?

2) How many meters area will be used by this project?

b. Mr. Sukarjo (Chief of RT. 16 of Kertapati Area)

1) How many meters area will be used by this project?

2) Project impact to the people and relocation do, we hope so if we will be given compensation by land

c. Mr. Ngadimen (Chief of RT. 21 of Kertapati Area)

1) When will do the project?

2) We hope so if we will be given compensation by land

d. Mr. Sarjito (Chief of RT. 18 of Kertapati Area)

1) When will do the project?

- 2) If the project is heaven, we must discuss firstly so that it will not heaven in the future?
- e. Mr. Asat (Chief of RT. 36 of Kertapati Area)
 - 1) How many meters area will be used by this project?
 - 2) How many wide will be used land from the track now?
 - 3) RT. 36 Area is in the project area.
2. Part. 2, there are two persons such as:
 - a. Mr. Edi (Chief of RT. 36 of Kertapati Area)
 - 1) Why the project do from Kertapati till Sukacinta only?
 - 2) How your opinion if the project will do to Mariana Village?
 - b. Mr. Sugeng (Chief of RT. 18 of Kertapati Area)
 - 1) Before coming or meeting actually there are many issue about relocation, it makes be worry the people.
- C. Finish and Thanks
- D. List of Participants

**LIST OF PEOPLE ATTEND
SOCIALIZATION OF DOUBLE TRACK IS WITH KERTAPATI PEOPLE**

Date, January, 27. 2012

NO	NAME	AGE	AREA	OCCUPATION	LIVING (YEARS)
1	EME SUKARMA	70	Chief of RW. 07	PORTER	1984
2	LENI TRIANA S.Pd	42	Chief of RT. 35	TEACHER	1984
3	ARSAD	55	Chief of RT. 36	PORTER	1986
4	ASMUNI	40	Chief of RT. 38	PORTER	1990
5	AGUS RIANO	60	Society of RT. 35	PORTER	1975
6	SUKARTONO	64	Society of RT. 35	PORTER	1975
7	BAMBANG W	46	Society of RT. 20	PORTER	1990
8	M. ROPIAN D	60	Chief of RT. 16	PORTER	1952
9	AGUS RIYANTO	30	Chief of RW. 07	PORTER	1952

10	SUKOCO	55	Society of RT. 16	PORTER	1981
11	SURADI	61	Society of RT. 16	PORTER	1970
12	BASTONI	42	Society of RT. 21	EMPLOYEE OF PT.KAI	1970
13	WANADI	67	Society of RT. 21	PORTER	1955
14	SUJIONO	40	Society of RT. 17	EMPLOYEE OF PT.KAI	1993
15	NGADIMIN, S.Pd	60	Society of RT. 21	EMPLOYEE OF GOVERMENT	1970
16	ZAINAL	41	Society of RT. 16	EMPLOYEE OF PT.KAI	1991
17	SARJITO	43	Society of RT. 18	PORTER	1968
18	SYAMSUDDIN U	59	Society of RT. 16	PENSION OF PT.KAI	1963
19	SADIKIN	43	Society of RT. 18	EMPLOYEE OF PT.KAI	1968
20	TUGIMAN	72	Society of RT. 18	PENSION OF PT.KAI	1961
21	SUPRAPTO	56	Society of RT. 18	PENSION OF PT.KAI	1955
22	SUPRIYATNA	68	Society of RT. 20	PENSION OF ARMY	1970
23	SUWARI	60	Society of RT. 18	PENSION OF PT.KAI	1985
24	PANI	33	Society of RT. 38	PORTER	1990
25	YUDI	28	Society of RT. 38	PRIVATE WORK	1994
26	RUSLI	60	Society of RT. 38	PORTER	1960
27	SISWANTORO	48	Society of RT. 19	EMPLOYEE OF PT.KAI	1989
28	ABAS	33	Society of RT. 38	PORTER	1987
29	PENDI	42	Society of RT. 38	PORTER	1990
30	WAHID	33	Society of RT. 38	PORTER	1997
31	UDIN	32	Society of RT. 38	PORTER	1999
32	DEDI	28	Society of RT. 38	TRADE	1998
33	EDI	41	Society of RT. 38	PORTER	1980
34	DENY S	32	Society of RT. 38	PORTER	1987
35	ASOT	30	Society of RT. 38	PORTER	1990
36	SUGENG PRIYONO	52	Society of RT. 19	EMPLOYEE OF PT.KAI	1968
37	YUDI	31	Society of RT. 19	PRIVATE WORK	1985



(Translation from Indonesian –Compensation Regulation for Land Acquisition)

**GOVERNOR OF SOUTH SUMATRA
GOVERNOR OF SOUTH SUMATRA REGULATION**

NUMBER 25 of 2009

CONCERNING

**BASIC OF COMPENSATION STANDARD ABOUT LANDS, PLANTS, AND BUILDINGS IMPACT
EXPLORATION AND EXPLOITATION FROM STATE-OWNED CORPORATION AND PRIVATE
COMPANY ETC.**

WITH THE BLESSING OF GOD ALMIGHTY

GOVERNOR OF SOUTH SUMATRA

Considering : a. That compensation standard to release land, plant which
impact exploration and exploitation about oil, gas and mine that are decided by
Governor of South Sumatra regulation number 20 of 2004 because of
compensation has nothing relevant and be need completed and compatible;

b. That completed and compatible as item “A” was arranged
and be decided by Governor of South Sumatra regulation

Bearing in Mind : 1. Law no. 25 of 1959 concerning union of South Sumatra of
regional goverment (state gazette of Republic of Indonesia
No. 70 of 1959, supplement to state gazette of Republic of
Indonesia no 1814) ;
2. Law no. 5 of 1960 concerning Base agrarian regulation
(state gazette of Republic of Indonesia no. 104 of 1960,
supplement to state gazette of Republic of Indonesia no. 2043) ;
3. Law no. 20 of 1961 concerning rightful of land and
anything on it (state gazette of Republic of Indonesia no.
228 of 1961, supplement to state gazette of Republic of
Indonesia no. 2324) ;
4. Law no. 12 of 1999 concerning plant develop system (state

- gazette of Republic of Indonesia no. 46 of 1992, supplement to state gazette of Republic of Indonesia no. 3478) ;
5. Law no. 41 of 1999 concerning forestry (state gazette of Republic of Indonesia no. 67 of 1999, supplement to state gazette of Republic of Indonesia no 3888) amendment law no. 86 of 2004, supplement to state gazette of Republic of Indonesia no. 4412) ;
 6. Law no. 22 of 2001 concerning oil and gas (state gazette of Republic of Indonesia no. 136 of 2004, supplement to state gazette of Republic of Indonesia no. 4152) ;
 7. Law no. 18 of 2004 concerning plantation (state gazette of Republic of Indonesia no. 85 of 2004, supplement to state gazette of Republic of Indonesia no. 4411) ;
 8. Law no. 32 of 2004 concerning regional government (state gazette of Republic of Indonesia no. 125 of 2004, supplement to state gazette of Republic of Indonesia no. 4437) amendment law no. 12 of 2008 (state gazette of Republic of Indonesia no. 59 of 2008, supplement to state gazette of Republic of Indonesia no. 4844);
 9. President Decree no. 38 of 2005 concerning defense (state gazette of Republic of Indonesia no. 60 of 2003);
 10. President Regulation no. 36 of 2005 concerning supplied to building for people amendment president regulation no. 65 of 2006.
 11. Chief of Defense Corporation Decree no. 3 of 2007 concerning carry out President Decree no. 65 of 2006 concerning supplied land to build of need people.

HAS DECIDED :

Maintain : GOVERNOR REGULATION BASIC OF COMPENSATION STANDARD ABOUT LAND, PLANTS, AND BUILDINGS IMPACT EXPLORATION AND EXPLOITATION FROM STATE-OWNED CORPORATION AND PRIVATE COMPANY ETC.

CHAPTER I GENERAL RULE

Articel 1

Regulation Governor mean with :

1. Province is South Sumatra Province

2. Governor is Governor of South Sumatra
3. Compensation is paid by business field, law field, state-owned corporation, regional corporation and private company which carried out to belong land, building and anything to relationship directly. It will do exploration and exploitation about oil, gas, mine, electricity and then plantation in South Sumatra Province.
4. Exploration is the act of seaching for the purpose of discovery of resources or information about natural resources at area decidedly
5. Exploitation is the act of searchng for the purpose of taking natural resources at area decidedly which kinds are drilling, building of transportation, save and carry natural resources out so all of work to support it.
6. Farm is an area of land, to the practice of producing and managing food and animal husbandry
7. Plantation is done to develop about it by company, Cooperation Corporation and society from small scale, middle and big scale.
8. Land Proprietary rights is society which land proprietary rights in the same manner as law no. 5 of 1960 concerning agrarian base regulation including land proprietary rights which is admitted by society.

CHAPTER II

COMPENSATION OF EXPLORATION AND EXPLOITATION

Part 1

Compensation of Exploration

Section 2

1. According to act a land, compensation from a land in the exploration of oil, gas, and , energy, mine workings are decided such as :
 - a. Land, swamp, plants wild is owned Rp 1.350,-/m2
 - b. Crops and plants land Rp 2.700,-/m2
 - c. Field rice Rp 3.300,-/m2
 - d. Plantation Rp 4.050,-/m2
 - e. Plantation of fruits Rp 2850,)=
2. If when exploration has influence a tree or trees to cut so compensation same when exploitation.
3. Compensation which is done as section 2 including all of exploration
4. If wood which useful to make bridge above swamp by diameter 10 cm and be long 4 m, it belongs society so compensation such as :
 - a. Wood is from forest Rp 12.000,-
 - b. Wood is from belong society Rp 24.000,-

5. If building home of project use wood society so compensation Rp 120.000,-/@ home
6. If landing strip is built by society land for helicopter so compensation such as :
 - a. If landing strip made wood but it is in project area so compensation such as : wide of landing strip will be paid half of article 1
 - b. If landing strip made wood but it is not in project area so compensation such as :
 1. Compensation of wood is double of article 1
 2. Compensation is compatible of wide of landing strip
 - Small (0 - 35 m2) Rp 415.800,-/@ landing strip
 - Middle (36 – 42 m2) Rp 498.000,-/@landing strip
 - Wider (43 – 50 m2) Rp 594.000,-/@ landing strip
7. If place is used to survey of seismic exploration so compensation decided as:
 - a. seismic to add/m Rp 5000,-
 - b. seismic hole/ hole Rp 25.000,-
8. Compensation payment of land in the same manner as article (1), (5), (6), and (7) so it has nothing influence to own land
9. If exploration location or exploitation location has resource natural certainly which will useful continual so regulation base will be done to release landing strip by discussion
10. Exploration will be done 3 year longer

Part. 2

Exploitation Compensation

Article 3

1. Release Compensation is based by value of sale object tax (NJOP) a year carry attention out to real value which is based team's value who is trust to do it.
2. Rubber tree special which has nothing used prime seed and technical plantation in the same manner as age (year);
 - 1 year Rp 60.247,-/@tree
 - 2 year Rp 79.191,-/@tree
 - 3 year Rp 100.864,-/@tree
 - 4 year Rp 125.462,-/@tree
 - 5 year Rp 154.220,-/@tree
 - 6 year Rp 184.483,-/@tree
 - 7 year Rp 200.151,-/@tree
 - 8 year Rp 213.238,-/@tree
 - 9 year Rp 218.160,-/@tree

- 10 year Rp 214.616,-/@tree
- 11 year Rp 207.200,-/@tree
- 12 year Rp 212.577,-/@tree
- 13 year Rp 209.555,-/@tree
- 14 year Rp 202.751,-/@tree
- 15 year Rp 195.331,-/@tree

3. Orange Garden has nothing used prime seed and technical plantation, the compensation was :
4. Coffee Garden has nothing used prime seed and technical plantation
5. Tea Garden has nothing used prime seed and technical plantation
6. Clove has nothing used prime seed and technical Plantation
7. Coconut Gardens of dry soil has nothing used prime seed and technical plantation
8. Coconut Gardens of ebb and flow of land has nothing used prime seed and technical plantation
9. Hybrid coconut Plantation has nothing used prime seed and technical plantation
10. Pepper Garden has nothing used prime seed and technical plantation
11. Cacao Plantation has nothing used prime seed and technical plantation
12. Oil Palm Plantation has nothing used prime seed and technical plantation
13. Pineapple Garden has nothing used prime seed and technical plantation
14. Banana Garden has nothing used prime seed and technical Plantation
15. Duku Garden or Durian Garden or Manggis Garden has nothing used prime seed and technical plantation
16. Rambutan Garden or Mango Garden or longan Garden or Sawo Garden has nothing used prime seed and technical plantation
17. Jackfruit Garden or Cempedak Garden or Avocado Garden or Breadfruit Garden or Melinjo Garden or Soursop Garden or Petai Garden or Rose Apple Garden has nothing used prime seed and technical Plantation
18. Annual crops including herbs and vegetables would be paid suit time for that farm

Article 4

1. The garden used of improved seeds and farm management to follow the technical culture which be given compensation 200% multiplied by prevailing rates
2. The garden would no longer produce that be given compensation 50%
3. The garden were more Plantation in a land which be given compensation by prevailing rate
4. The farm commodities were not included in article 3 would be given compensation by prevailing rate

Article 5

1. State-owned enterprises, cooperatives or private companies did activities but it has nothing change natural state so they would be given compensation suit felled trees except obligation would be decided
2. Compensation of trees in forestry suited Rate of natural forestry provision (PSDH) and reforestation payment (DR)
 - a. Rate of Natural Forestry Provision (PSDH)
 - (1) The beautiful wood Rp 108.000,-/m3

- (2) The Wood of Meranti Group :
- For diameter 30 cm up Rp 60.000,-/m3
 - For diameter 30 cm below Rp 2.450,-/m3
- (3) The Wood of fix forestry
- For diameter 30 cm up Rp 36.000,-/m3
 - For diameter 30 cm below Rp 2.450,-/m3
- b. Reforestation Payment (DR)
- (1) The beautiful wood US \$ 18/m3
- (2) The Wood of Meranti Group :
- For diameter 30 cm up US \$ 14/m3
 - For diameter 30 cm below US \$ 2/m3
- (3) The Wood of fix forestry
- For diameter 30 cm up US \$ 12/m3
 - For diameter 30 cm below US \$ 2/m3
- c. Owner of the company's profit license for utilization of forest
- (1) The beautiful wood Rp 108.600,-/m3
- (2) The Wood of Meranti Group :
- For diameter 30 cm up Rp 60.000,-/m3
 - For diameter 30 cm below Rp 24.500,-/m3
- (3) The Wood of fix forestry
- For diameter 30 cm up Rp 36.000,-/m3
 - For diameter 30 cm below Rp 24.500,-/m3
3. Compensation would be counted by prevailing rate but if before had belong a area, detail of payment such as:

a. Rate of Natural Forestry Provision (PSDH)

- Pine : Rp 3000,-/Ton
- Acacia : Rp 2000,-/Ton
- Balsa : Rp 1500,-/Ton
- Eucalypus Rp 2000,-/Ton
- Gmelina : Rp 2000,-/Ton
- Rubber : Rp 3000,-/Ton
- Sangon : Rp 1500,-/Ton

b. Cost Standard build forestry/Hectare

No	Age of Plantation (Year)	Compensation/Hectare (Rp/ha)
1	1 – 3	8.325.250,-
2	4	9.324.280,-
3	5	10.443.194,-
4	6	11.696.377,-

5	7	13.009.942,-
6	8	14.671.935,-
7	9	16.432.567,-
8	10	18.404.475,-

c. Corporate Profits

- For diameter 30 cm up : Rp 36.000,-/m3
- For diameter 30 cm below : Rp 24.500,-/m3
-

4. State-owned enterprises, Cooperatives and Private Companies used forestry self, they would be paid compensation such as :

a. Compensation would be given for natural forestry:

- (1) The beautiful wood Rp 108.000,-/m3
- (2) The Wood of Meranti Group :
 - For diameter 30 cm up Rp 60.000,-/m3
 - For diameter 30 cm below Rp 2.450,-/m3
- (3) The Wood of fix forestry
 - For diameter 30 cm up Rp 36.000,-/m3
 - For diameter 30 cm below Rp 2.450,-/m3

b. Compensation would be given for managed forestry:

(1) Standard cost of the plant

No	Age of Plantation (Year)	Compensation/Hectare (Rp/ha)
1	1 – 3	6.056.000,-
2	4	6.783.448,-
3	5	7.597.462,-
4	6	8.509.157,-
5	7	9.530.256,-
6	8	10.673.887,-
7	9	11.954.753,-
8	10	13.389.324,-

(2) Benefit Landowners

- For diameter 30 cm up Rp 36.000,-/m3
- For diameter 30 cm below Rp 2.450,-/m3

5. If fare changed meaning it was not relevant so compensation would be suited fare time.

Article 6

1. Compensation for river and swamp which was always useful government to auction every years that such as :
 - a. Before compensation, if it need to do research by expert team for mine or fishery or environment agency of South Sumatra together by meaning to know impact of contamination of petroleum and gas
 - b. Before compensation to do, Government with Komisi Team and Company and society discussed to fare of compensation.
2. Plantation or swamp or rice damaged which be proved by expert from Mine, environment agency so compensation would be counted by Regulation Governor.

Part Three

COMPENSATION of BUILDING

Article 7

1. Compensation determined in accordance with standards of BAPPENAS (Council of National Regulation) and legislation applicable
2. The compensation referred to in paragraph (1) would be done after predicted and discussed with the relevant authorities
3. The compensation about irrigation was made by Government or Society determined by the research team which be formed by Governor or Regent or Regional Government each of place.

CHAPTER III

FINANCE

Article 8

Funding for surveillance and control teams need state-owned land, enterprises and other private companies including the certificate fee waiver

CHAPTER IV

TRANSITIONAL PROVISIONS

Article 9

Payments of compensation was still being done under the agreement but Compensation did suit the Governor Regulation

CHAPTER V

CLOSING PROVISIONS

Article 10

1. Governor Regulation based compensation of land compensation, Plantation compensation and building compensation damaged exploration and exploitation of Owned-State Corporation, owned enterprises and private companies.
2. Principally of compensation based discussion which damaged exploration and exploitation of Owned-State Corporation, owned enterprises and private companies.

Article 11

Compensation of land, Plantation and building were regulated by Governor Regulation so compensation of them did use Governor Regulation except other Regional.

Article 12

1. If this Governor Regulation shall come into force as of the stipulation date about compensation of land, plantation and building damaged exploration and exploitation so Governor Regulation of South Sumatra no. 20 of 2004 repealed and declared invalid
2. Things that have not been sufficiently regulated in Governor Regulation about the technical implementation will be further defined by Governor

Article 13

This Governor Regulation shall come into force as of the stipulation date.

Therefore knowing all of that Governor Regulation made in Regional News of South Sumatra Province

Stipulated in Palembang

On the date of April, 02. 2009

GOVERNOR OF SOUTH SUMATRA

Signed H. ALEX NOERDIN

Enacted in Palembang

on 3 April 2009

Signed MUSYRIF SUWARDI

LOCAL NEWS SOUTH SUMATRA PROVINCE

NUMBER : 1 OF 2009 SERIES C

**MEMORANDUM OF UNDERSTANDING (MOU)
AMONG CIVIL LAW AND STATE ADMINISTRATION**

BETWEEN

**PT. KERETA API (PERSERO)
REGIONAL DIVISIONS III OF SOUTH SUMATRA**

WITH

HIGH COURT of SOUTH SUMATRA

Number : LL.005/XI/01/DRIIIS.2009

MEMORANDUM OF UNDERSTANDING (MOU)

AMONG CIVIL LAW AND STATE ADMINISTRATION

BETWEEN

PT. KERETA API (PERSERO)

REGIONAL DIVISION III OF SOUTH SUMATRA

WITH

HIGH COURT OF SOUTH SUMATRA

NUMBER : LL.005/XI/01/DRIIIS.2009

NUMBER : B-3647/N.6/G/11/2009

The day; Thursday; November, 19 of 2009 (19-11-2009), we are undersigned that :

1. Drs. A. Herlianto : Eksekutif Vice Presiden of PT. Kereta Api (Persero)

Regional Divisions III of South Sumatra on behalf of Board

of Directors of PT. Kereta Api (Persero), by address; Jendral

Ahmad Yani Street No. 541, 13 Ulu Plaju of Palembang City

hereinafter called the First

2. Ibnu Haryadi, SH : Chief Of High Court by address; Ade Irma Nasution Street

No. 14 Palembang City, hereinafter called the Second

The first and the second hereinafter called by person of interest have made executed this MOU, such as:

Article 1

MOU has purpose to improve all of potentials and natural resource which belong person of interest to finish problems civil law and state administration was faced PT. Kereta Api Regional Divisions III of South Sumatra. To help without interfere among person of interest, every organization and every authority. It did with regulation each party:

Article 2

The first can ask to help about law, discussion about law, and all of law with The Second if the first faced

problem about law and further The second prepared to help about law, discussion about law, and all of law from the first.

Article 3

The first could give power of attorney to change Its If the first will sue or be sued in civil case inside or outside judiciary

Article 4

The first could give power of attorney to change Its if the first sued state administration in Judiciary

Article 5

In MOU, the second prepared power of attorney to change the first in civil case or and state administration problems inside or outside judiciary.

Article 6

The first prepared to give document or data which need by the second to be resolved problems and the second must know to the first with oral and written by carrying out will be done or have to.

Article 7

The first would give Legal Opinion to the second without power of attorney and the second would make and giving legal opinion to the first.

Article 8

If in the future there were something which had not been made in MOU including changed this MOU, it would be discussed and took agreement among person of interest to suit in a separate provision by written.

Addendum was separated with MOU.

Article 9

This MOU valid for two years after being signed and can be extended in accordance with the requirements for an agreement.

Article 10

All of payment from the first carried out duties which be regulated separately

Article 11

MOU made and be signed by all of person of interest in duplicate, each stamp to taste and have the same strength, each of them get one paper.

The Second

The First

Chief of High Court

Executive Vice President

South Sumatra

Regional Division III of South Sumatra

(Translation from Indonesian)

(A Sample of Order for Resettlement Proceedings from PT.KAI)

**RELEASE CHRONOLOGY OF PT. KERATA API INDONESIA LAND AND SOCIETY LAND BY
PAYMENT TO IMPACT THE DOUBLE RAILWAY FROM PRABUMULIH TO MUARA GULA
SRENGSEM VILLAGE
YEAR 2011**

REGULATED BASES ARE:

1. Statement Letter from Governor of South Sumatra number 25 year 2009
2. MOU (Cooperation) with Judiciary of High Court
3. License Government of Village
4. Accounting from General Department

FOLLOW UP PROCUDING:

PT. Kereta Api's Team and Judiciary Office will send a letter to chief of village and security of the place for carrying out the following matters:

- Release Socialization about compensation payment of list of people, plantation and building (houses)
- After making agreement of payment P.T. Kereta Api will pay 30% to the people at first.
- Payment is attended by Judiciary team, PT. Kereta Api Indonesia team, and Chief of Village by taking related pictures as evidences.

English Version
Survey Sheet for Village on Socio-Economic Impacts
Sheet Code No.....
Section:.....
Survey Date:.....
Surveyed by.....
Local Official Name:.....Position:.....
1. Place in Project Area:.....
2. Village / District :.....
3. Area Coverage in Project Area:.....km Along Railway
4. Number of Households in this Area:.....
5. Situation of Land Use in this Area:.....
6. General Socio-Economic Conditions in this Area:.....
7. Number of Legal Households in this Area:.....
8. Number of Illegal Households in this Area:.....
9. Reasons for Illegal Occupation:.....
10. Number of Communities in this Area:.....
11. Places of Communities in this Area:.....
12. Starting Year of Establishing Communities in this Area:.....
13. Social Groups of Inhabitants:.....
14. Indigenous/ Underprivileged Groups in this Area: No • Yes
.....
15. Major Occupations of Local Inhabitants:.....
16. .Number of Households Living with Railway-Related Jobs:.....
.....
17. Particular Socio-Economic Features of this Area:

.....

18. Particular Historic/ Cultural Sites or Heritages in this Area:

19. Socio-Economic Impacts by Project Implementation:
 No / Yes
 Reasons:.....
 Kinds of Impacts:.....
 Impact Level:.....

20. Impacts to Historic/ Cultural Sites or Heritages by Project Implementation:
 No / Yes
 Reasons:.....
 Kinds of Impacts:.....
 Impact Level:.....

21. Communities Affected by Project Implementation: No/ Yes
 Community:.....Affected Items:.....Affected HH:
 Community:.....Affected Items:..... Affected HH.....
 Community:.....Affected Items:.....Affected HH.....

22. Households Subjected to Resettlement by Project Implementation:
 Community:.....Affected HH:.....Legal Status.....
 Community:.....Affected HH:..... Legal Status:
 Community:.....Affected HH:.....Legal Status:.....

23. Possible Places for Relocation:
 Community.....Place:.....Land Status:.....
 Community.....Place..... Land Status:.....
 Community.....Place:.....Land Status:.....

24. Households of Underprivileged Groups Subjected to Resettlement :
 Community:.....Affected HH:.....Social Group:.....
 Community:.....Affected HH:..... Social Group:.....
 Community:..... Affected HH:..... Social Group:.....

25. Problems of Inhabitants in Present Daily Living Conditions :
 No / Yes
 Reason:.....

26. Improvements in Daily Living Conditions by Project Implementation:
 No / Yes
 Reason:.....

27. Measures for Mitigating Negative Impacts in this Area :.....

28. Measures for Mitigating Resettlement Losses in this Area :.....

29. Measures for Assisting Resettlement Proceedings in this Area :.....

30. Measures for Assisting Income Generation After Resettlement i :.....

31. Measures for Assisting Social Life in This Area:.....

32. Measures for Environmental Protection and Management:

33. Measures for Enhancing Community-Participation Activities:.....

34. Your Intention to Participate in Stakeholders Meeting: Yes / No
 Reason:.....

35. Any Expected Benefits in Local Socio-Economic Life from Project Implementation:
 Yes / No
 Reason:.....

36. Any Hopes for Construction / Improvement of Social Infrastructure/ Facility:
 Yes / No
 Reason:.....

REMARKS ON SOCIO-ECONOMIC IMPACTS IN THIS AREA:

.....

Indonesian Version

SURVEI DESA-DESA (SEKITAR 50 DESA)

LAMPIRAN 1

Lembar Survei Mengenai Dampak Sosial-Ekonomi

Nomor Kode :
 Batas Area :
 Tanggal Survei :
 Penyurvei :
 Nama Petugas Lokal :
 Jabatan:

- 1) Tempat di Area Proyek:
- 2) Desa/Kabupaten:
- 3) Area yang Tercakup dalam Area Proyek: km di sekitar rel
- 4) Jumlah Kepala Keluarga dalam Area:
- 5) Kondisi Umum Sosial-Ekonomi dalam Area:

- 6) Jumlah Rumah Tangga Resmi dalam Area:
- 7) Jumlah Rumah Tangga Tak Resmi dalam Area:
- 8) Alasan Status Tak Resmi:

- 9) Jumlah Komunitas dalam Area:
- 10) Lokasi Komunitas dalam Area:

- 11) Tahun Berdirinya Komunitas dalam Area:
- 12) Kelompok Sosial Penduduk:
- 13) Warga Asli/Kurang Mampu dalam Area: **Ya • Tidak**
- 14) Pekerjaan Mayoritas Penduduk Lokal:

- 15) Jumlah Rumah Tangga dengan Pekerjaan yang Terkait Perkeretaapian:
- 16) Ciri-ciri Khusus Sosial-Ekonomi:
- 17) Situs Bersejarah atau Warisan Budaya dalam Area:
- 18) Dampak Sosial-Ekonomi dari Pelaksanaan Proyek:
Ya / Tidak
 Alasan:
 Jenis Dampak:
 Tingkat Dampak:
- 19) Dampak Terhadap Situs Bersejarah atau Warisan Budaya dari Pelaksanaan Proyek:
Ya / Tidak
 Alasan:
 Jenis Dampak:
 Tingkat Dampak:
- 20) Komunitas yang Terpengaruh Akibat Pelaksanaan Proyek: **Ya / Tidak**
 Komunitas... Hal yang Terpengaruh:Jumlah RT yang Terpengaruh:
 Komunitas ...Hal yang Terpengaruh: Jumlah RT yang Terpengaruh:
 Komunitas:...Hal yang Terpengaruh..... Jumlah RT yang Terpengaruh:
- 21) Rumah Tangga yang Harus Direlokasikan Akibat Pelaksanaan Proyek:
 Komunitas:RT yang Terpengaruh:..... Legalitas Status:.....
 Komunitas:.....RT yang Terpengaruh:Legalitas Status:.....
 Komunitas:.....RT yang Terpengaruh:.....Legalitas Status:.....
- 22) Tempat yang Memungkinkan untuk Relokasi:
 Komunitas:.....Lokasi:.....Status Lahan:
 Komunitas:.....Lokasi:..... Status Lahan:
 Komunitas:.....Lokasi:.....Status Lahan:
- 23) Rumah Tangga dari Golongan Kurang Mampu yang Turut Direlokasi:
 Komunitas:.....RT yang Terpengaruh:.....Kelompok Sosial:
 Komunitas:.....RT yang Terpengaruh:.....Kelompok Sosial:
 Komunitas:.....RT yang Terpengaruh:.....Kelompok Sosial:.....
- 24) Masalah yang Dihadapi Penduduk dalam Kehidupan Sehari-Hari Saat ini:
Ya / Tidak
 Alasan:.....
- 25) Kemajuan Terhadap Kehidupan Sehari-Hari Akibat dari Pelaksanaan Proyek:
Ya / Tidak
 Alasan:

- 26) Tindakan untuk Meminimalisir Dampak Negatif dalam Area:
-
- 27) Tindakan untuk Meminimalisir Kehilangan Tempat Tinggal dalam Area:
-
- 28) Tindakan untuk Membantu Proses Relokasi dalam Area:
- 29) Tindakan untuk Membantu Pendapatan Penduduk Setelah Relokasi:
- 30) Tindakan untuk Membantu Kehidupan Sosial dalam Area:
- 31) Tindakan untuk Perlindungan dan Pengelolaan Lingkungan Hidup:
- 32) Tindakan untuk Meningkatkan Kegiatan Partisipasi Komunitas:
- 33) Keinginan Anda untuk Berpartisipasi dalam Pertemuan Stakeholder: Ya / Tidak
- 34) Harapan akan Manfaat dalam Kehidupan Sosial-Ekonomi Lokal terhadap Pelaksanaan
Proyek:
Ya / Tidak
Alasan:
.....
- 35) Harapan akan Pembangunan atau Peningkatan Pra-Sarana/Fasilitas Sosial:
Ya / Tidak
Alasan:
.....

<p>English Version</p> <p>Census Survey Sheet for Affected Household in Project Area</p> <p>Sheet Code No.:.....</p> <p>Survey Date:.....</p> <p>Section:.....</p> <p>Village/ District:.....</p> <p>Surveyed by:.....</p> <ol style="list-style-type: none"> 1. HH Chief's Name:..... 2. Starting Year for Living in Project Area:..... 3. Reason for Living in Project Area 4. Legal Status of Household and Land : Legal/ Illegal Reason:..... 5. Occupied Land Area: .....m2 6. Household Type: Light Material / Wood / Brick / Concrete 7. Year of Construction:..... 8. Construction Cost:..... 9. Finance/ Material Source:..... 10. Total Floor Area: .....m2 11. Number of Family Members:..... 12. Family Structure:..... 13. Social Group:..... 14. Getting Social Assistance: Yes / No Reason:..... 15. If Yes Money Sum / Materials:.....Source:..... 16. Actual Profession:..... 17. Job Place:..... 18. Transport Means to Job Place:..... 19. Average Monthly Income:..... 20. Average Monthly Living Expenses:..... 21. Children Going to School: Yes / No Reason:..... 22. If Yes School Place:..... 23. Transport Means for Schooling:..... 24. Transport Means to Market:..... 25. Transport Means to Hospital:.....

26. Availability of Private Transport Means: Yes / No
 If Yes Kind of Transport Means:.....Number of Years for Use:.....years
27. Participation in Local Community Life :
 Never / Sometimes / Frequently / Mostly / Always
 Occasions:.....
27. Situation of Using Railway:
 Never / Sometimes / Frequently / Mostly / Always
 Occasions:.....
28. Situation of Markets/ Shops for Purchasing Goods in the Area:
 Good / Medium / Bad
 Reason:.....
29. Situation of Schools for Children in the Area;
 Good / Medium / Bad
 Reason:.....
30. Situation of Hospitals/ Clinics in the Area;
 Good / Medium / Bad
 Reason:.....
31. Situation of Schools for Children in the Area;
 Good / Medium / Bad
 Reason:.....
32. Situation of Mosque in the Area;
 Good / Medium / Bad
 Reason:.....
33. Problems in Actual Living Conditions:.....

34. Knowing about Project Implementation: No/ Yes.....
 Information Source:.....Period:.....
35. Your Opinions on Project Implementation:.....

36. Your Problems by Project Implementation:.....

37. Is Your Household Subjected to Resettlement for Project Implementation?
 Yes / No Reason:.....
38. If Being Subjected to Resettlement for Project Implementation, Your Response will
 be Yes / No Reason:.....
39. Availability of Private Properties and Items Affected by Project Implementation:

Yes / No
Reason:.....
.....

40. Estimated Loss from Affected Properties:
.....

41. Need for Compensation (Estimated Sum):
Yes/ No Reason:.....
.....

42. Self Preparation of Relocation Place:
Yes / No Reason:
.....

43. Need of Relocated Area Prepared by PT. KAI:
Yes / No Reason:.....
.....

44. Need for Assistances for Resettlement:
Yes / No
Kinds of Assistance:.....
Reason:.....

45. Need for New Job in Relocated Area:
Yes / No
Kind of Job:.....
Reason:.....

46. Ideas for Mitigating Resettlement Problems:.....
.....
.....

47. Opinions about Project Implementation:.....
.....
.....

Remarks on Survey Results:
1.....
2.....
3.....

Indonesian Version
SURVEI RUMAH TANGGA (100 KEPALA KELUARGA)
LAMPIRAN 2
Lembar Survei bagi Rumah Tangga dalam Area Proyek

Nomor Kode :

Tanggal Survei :

Batas Area :

Desa/Kabupaten :

Penyurvei :

1) Nama Kepala Rumah Tangga:

2) Mulai Tinggal di Area Proyek Tahun:

3) Alasan Tinggal di Area Proyek:

4) Legalitas Status Rumah Tangga dan Lahan: Resmi / Tak Resmi
 Alasan:

5) Luas Lahan yang Ditinggali:m²

6) Jenis Bangunan: Bahan Ringan / Kayu / Bata / Beton

7) Dibangun Tahun:

8) Biaya Pembangunan:

9) Sumber Keuangan/Bahan Bangunan:

10) Total Luas Bangunan:m²

11) Jumlah Anggota Keluarga:

12) Struktur Keluarga:

13) Kelompok Sosial:

14) Kebutuhan Bantuan Sosial: **Ya / Tidak**. Alasan:
 Jika **YA**, Jumlah Uang/Bahan Bangunan: Sumber: ...

15) Pekerjaan:

16) Tempat Kerja:

17) Alat Transportasi ke Tempat Kerja:

18) Pendapatan Rata-rata Bulanan:

19) Pengeluaran Rata-rata Bulanan:

20) Pendidikan Anak: **Ya / Tidak**. Alasan:
 Jika **YA**, Nama Sekolah:
 Alat Transportasi ke Sekolah:

21) Alat Transportasi ke Pasar:

22) Alat Transportasi ke Rumah Sakit:

23) Tersedia Alat Transportasi Milik Pribadi: **Ya / Tidak**
 Jika **YA**, Jenis Alat Transportasi:..... Tahun Penggunaan:tahun

24) Partisipasi dalam Kehidupan Komunitas Lokal:
Tidak Pernah / Kadang-kadang / Sering / Hampir Selalu / Selalu
 Dalam Kesempatan:

- 25) Kondisi Penggunaan Rel Kereta Api:
Tidak Pernah / Kadang-kadang / Sering / Hampir Selalu / Selalu
 Dalam Kesempatan:
- 26) Kondisi Pasar/Toko Tempat Berbelanja dalam Area:
Baik / Sedang / Buruk
 Alasan:
- 27) Kondisi Sekolah untuk Anak-anak dalam Area:
Baik / Sedang / Buruk
 Alasan:

- 28) Kondisi Rumah Sakit/Klinik dalam Area:
Baik / Sedang / Buruk
 Alasan:

- 29) Kondisi Masjid dalam Area:
Baik / Sedang / Buruk
 Alasan:

- 30) Masalah dalam Situasi Kehidupan Sebenarnya:
- 31) Pengetahuan akan Pelaksanaan Proyek: **Ya / Tidak**
 Sumber Informasi: Periode:
- 32) Pendapat Mengenai Pelaksanaan Proyek:
- 33) Masalah Terkait Pelaksanaan Proyek:
- 34) Rumah Tangga Anda Termasuk yang Akan Direlokasi demi Pelaksanaan Proyek?
Ya Tidak. Alasan:
- 35) Jika YA, Tanggapan Anda:
Ya / Tidak. Alasan:
- 36) Anda Bersedia jika Lahan dan Benda Milik Pribadi Terkena Efek Pelaksanaan Proyek:
Ya / Tidak. Alasan:
- 37) Perkiraan Kerugian dari Milik Pribadi yang Terkena Efek:
- 38) Anda Membutuhkan Kompensasi? (Perkiraan Jumlah)
Ya / Tidak. Alasan:
- 39) Anda Mempersiapkan Sendiri Tempat Relokasi?
Ya / Tidak. Alasan:

.....

40) Anda Membutuhkan Area Relokasi yang Disiapkan PT. KAI?
Ya / Tidak. Alasan:

.....

41) Anda Membutuhkan Bantuan untuk Pemindahan?
Ya / Tidak
 Jenis Bantuan:
 Alasan:

42) Anda Membutuhkan Pekerjaan Baru di Area Relokasi?
Ya / Tidak
 Jenis Pekerjaan:
 Alasan:

43) Ide untuk Meminimalisir Masalah Pemindahan:

.....

44) Pendapat Mengenai Pelaksanaan Proyek:

.....

Catatan pada Hasil Survei:

1.

.....



SURVEY WORKS

ON

**SOCIAL IMPACTS AND RESETTLEMENT MATTER FOR
“THE PROJECT FOR CAPACITY EXPANSION OF RAILWAY
LINE LAHAT - KERTAPATI IN SOUTH SUMATRA”**

FINAL REPORT



**INDONESIA RAILWAYS OFFICIAL COOPERATION CENTER
DIVISION REGIONAL III SOUTH SUMATRA TEAM
PALEMBANG CITY, FEBRUARY 2012**

Table of Content

1. Project Background	1
2. Survey Areas	3
3. Scope of Surveys	3
4. Survey Methodology and Proceedings	4
5. Preliminary Survey Results	5
6. Evaluation of Findings From Survey Results	
(1) Identification of Affected Areas	14
(2) Identification of Socio-Economic Impacts by Project Implementation	15
(3) Surveys on Occupations and Incomes of Occupants	16
(4) Situation of Land Use in Project Area	17
(5) Regional Governance and Organization	18
(6) Situation of Social Infrastructures	22
(7) Situation of Social Services	23
(8) Indigenous Groups	25
(9) Underprivileged Groups	26
(10) Historic and Cultural Heritages	27
(11) Gender Matter	28
(12) Children Matter	31
(13) Social Conflicts	36
(14) Infection Diseases	37
(15) Labor Environment	38
(16) Needs for Compensations and Assistances for Resettlement	39
7. Identification of Major Impacts and Problems	40
8. Preliminary Estimation of Compensation for Resettlement	41
9. Proposed Mitigation Measures	42
10. Proposed Measures for Improvements in Living Conditions	42
11. Proposed Measures for Improvements in Environmental Aspects	43
12. Proposed Measures for Improvements in Social Aspects	44
13. Conclusion and Recommendation	45

Annex

- 1. Inventory 1: Inventory of socio-economic conditions of villages in project area**
- 2. Inventory 2: Inventory of households survey in project area.**
- 3. Minutes of Meeting with Inhabitants in Kertapati Station Area**

**SURVEY WORKS
ON
SOCIAL IMPACTS AND RESETTLEMENT MATTER
FOR
THE PROJECT FOR CAPACITY EXPANSION OF RAILWAY
LINE
LAHAT - KERTAPATI IN SOUTH SUMATRA”**

Made by PERSERO

**(Indonesia Railways Official Cooperation Center)
Division Regional 3 South Sumatra**

1. Project Background

PT. Kereta Api Indonesia (PT.KAI), the Indonesia Railway Company in South Sumatra, is planning to realize the capacity expansion of the Lahat-Kertapati line (portion of red line on the below map) to have max. 2.7 MtPA by 2020. Furthermore, it is understood that there will be potential demand by other private coal mines for coal transportation on the Lahat-Kertapati line, and the total expected capacity is presently estimated at 10 MtPA on this line. The study is being conducted to assess the technical and financial feasibility for double tracking and infrastructure improvement on the existing Lahat-Kertapati line for Japanese ODA loan proceedings.



Map of the Project Area

This Project will bring certain socio-economic benefits to the region such as

1. The growth of coal mining industry,
2. The increase in business opportunity
3. Job creation in construction works,
4. Rolling stock industry PT. KAI or other railway operators
5. As well as the improvement for local passengers to access to schools, hospitals and etc.

JICA Team is carrying out a PPP study of F/S level for this Project, which would be subjected to Japan ODA loan proceedings.

For this purpose, JICA Team entrusted the survey works and the preparation of the Report on Social Impacts and Resettlement Matter for this Project to PUSKOPKA of PERSERO (Indonesia Railways Official Cooperation Center Division Regional III South Sumatera).

As part of Indonesia Railway Company, we, PUSKOPKA Team, are really willing to support about this Project. Therefore, we are ready to conduct these survey works because this Project will bring certain social economic benefits for South Sumatra Province in the future.

Objectives of the survey works are as follows:

- 1) To survey more than 50 villages and 100 households in the Project Area
- 2) To obtain sufficiently related data and information for preparing the Final Report
- 3) To obtain regulations and proceedings for relocation of occupants in the survey areas
- 4) To identify the impacts to socio-economic aspects by places and impact-levels, the serious socio-economic problems, the numbers of affected people and groups, the necessity and measures for relocation based on the results of surveys (households and villages).
- 5) To propose the mitigation measures as well the measures for improvements in living conditions and social aspects
- 6) To propose plans for executing these measures
- 7) To make conclusion and recommendation for the Final Report

Based on the results of analysis and evaluation of the results of survey works, PUSKOPKA Team will make the Final Report.

2. Survey Areas

As PT. Indonesia Railway is planning to increase shipping liner coal, by realizing double track line from Lahat – Kertapati line, survey work areas from Lahat to Kertapati. The survey areas along the railway are PT.KAI areas and on the left side of the direction from Lahat toward Kertapati.

Basically, there are two main survey areas :

1. Areas along the railway line from Sukacinta Station to Kertapati Station
2. Areas around Kertapati Station consisting of the area annexed to Kertapati Depot and the areas beside Musi River.

About areas along the railway line from Sukacinta Station to Kertapati Station, these areas are mainly village farmlands with plantations (rubber, palm etc.) and paddy fields, Village agglomerations could be particularly seen in areas nearby railway stations. These villages have long history of more or less 100 years back to the beginning of economic development and the construction of the railway in the 1910 by the Netherkands, Meanwhile in the areas around Kertapati station (Kertapati village) this land area of totally about 96 ha was previously a land area of forest and gardens. Administratively, this land belonged to landlords in the Dutch colonial period Presently, there are about households with a traditional market along the main road Simpang Sungki., There are many graves in this area. This also the most busy business area around Kertapati Station because more than 117 shops could be found in this area

3. Scope of Survey Works

The scope of survey works entrusted to PUSKOPKA is as follows:

- 1) To survey 100 households by using the Survey Form of Annex 1
- 2) To survey 50 villages by using the Survey Form of Annex 2
- 3) To submit the Final Report in English by analysis of the survey results.

4. Survey Methodology and Proceedings

Survey Methodology is follow

- Elaboration of JICA Team TOR, making groups for surveying Villages and Houses
- Direct Interviews to people in surveyed areas by survey groups
- Taking pictures (photos) and Videos in survey areas
- Observation and execution of survey works
- Filling up survey sheets
- Research and evaluation of surveyed sheets
- Recording the findings of social impacts
- Planning related programs

Proceedings of surveys are as follow:

For conducting these survey works, the survey targets by areas were divided as follows:

- ❖ Area from Lahat to Muara Enim 30 households and about 20 villages
- ❖ Area from Prabumulih to Simpang; 40 households and about 20 villages
- ❖ Area of Proposed Stockyard in Kertapati by side of the river; 30 households and about 10 villages

The survey areas along the railway are PT.KAI areas and on the left side of the direction from Lahat toward Kertapati the survey objects are as follows.

- The peoples who lives near railway line
- Situation in railway areas,
- Living conditions in railway areas,
- Social economy in railway areas and
- Compensation for resettlement and areas for relocation
- Identification, and analysis of collected information and data
- Planning assistance programs for relocators

5. Preliminary Survey Results

After one day of discussions and planning for conducting survey works on 11 January 2012, three (3) survey groups were formed for conducting field survey works in the Project Area.

The following photos show the survey works in the Project Area:



Mr. ABE taking photos in Project Area



Survey in Keramasan Area



Intake Survey at the house of one resident in the Project Area



Picture of one area around Sunan Rubber Company



Survey team picture together with one of the residents who live near the project site



one of survey households area at Kemang Agung



One of the survey work team took the survey data at
Sungai Rambutan



one of the house near the railway



Socialization with the community around the project area



List attend of meeting



Socialization with the community around the project area



Socialization in people who live in Area ABCD



Socialization with the community around the project area



Socialization with the community in area ABCD



Socialization with the community around the project area



Socialization with the community around the project area



Socialization with the community around
the project area in Kertapati station



Puskopka Team done Final Report



Train of Kertalaya, transportation for UNSRI Student at Simpang Station



At Inderalaya Station

After one week of survey works starting from 12 January 2012, the preliminary results of survey works (Number of Surveyed Villages and Households By Section) were obtained as follows:

Table 1: Number of Surveyed Villages and Households By Section

Section	Number of Villages	Number of Households	Remarks
1. SukaCinta-BanjarSari	14	18	Area along railway
2. BaniarSari-MuaraEnim	15	20	Area along railway
3. PrabuMulih-Lembak	12	31	Area along railway
4.Lembak - Karangendah	5	5	Area along railway
5. Karangendah-Gelumbang	5	10	Area along railway
6. Gelumbang – Serdang	2	2	Area along railway
7. Serdang – Payakabung	1	3	Area along railway
8. Payakabung – Simpang	1	3	Area along railway
9. Simpang – Kertapati	3	24	Areas around Kertapati station
10.Area around Kertapati station	2	16	Areas around Kertapati station
11. Area Near by river	-	6	Areas around Kertapati station
Total	60	137	

Based on data and information collected from survey works, analysis works were then evaluated together, which results are as follow:

Demographic Aspects in Project Area

Table 2: Basic Demographic Aspects of Surveyed Villages

Village	Section	Admini stration	Area (Ha)	Popul ation	Occupation	Living Condition
Suka cinta	Sukacinta - Banjarsari	Lahat	21.75	1500	Farmers and Public servant	The majority are farmers and civil servants, the average monthly income of Rp. 1,500,000, the average education level Schoolis Senior High School.
Lebak Budi	Sukacinta - Banjarsari	Lahat	5.8	400	Far mers	Life in this village are farmers so that the majority of the income here is uncertain
Prabu Menang	Sukacinta - Banjarsari	Lahat	14.5	1000	Far mers	Life in this village are farmers so that the majority of the income here is uncertain
Kebur	Sukacinta - Banjarsari	Lahat	3.625	250	Farmers and Labor	at current prices of rubber and coffee are down so that the economic citizens also fell
Tanjung Baru	Sukacinta - Banjarsari	Lahat	6.8875	475	Farmers and Labor	Life in this village are farmers so that the majority of the income here is uncertain
Muara Mau	Sukacinta - Banjarsari	Lahat	1.74	1200	The majority of rubber and coffee farmers	Life in this village are farmers so that the majority of the income here is uncertain
Sira Pulau	Sukacinta - Banjarsari	Lahat	43.5	3000	Rubber Farmers	Life in this village are farmers so that the majority of the income here is uncertain
Ulak Pandan	Sukacinta - Banjarsari	Lahat	72.5	5000	Farmers and Trader	at current prices of rubber are down so that the economic citizens also fell

Tanjung Jambu	Sukacinta - Banjarsari	Lahat	14.5	1000	Rubber Farmers and Labor	Life in this village are farmers so that the majority of the income here is uncertain
Negri Agung	Sukacinta - Banjarsari	Lahat	29	2000	Farmers and Trader	Life in this village are farmers so that the majority of the income here is uncertain
Tanjung Pinang	Sukacinta - Banjarsari	Lahat	52.2	3600	Farmers	economy in these villages rely on agricultural products
Telantang	Sukacinta - Banjarsari	Lahat	11.6	800	The majority of rubber and coffee farmers	Life in this village are farmers so that the majority of the income here is uncertain
Merapi	Sukacinta - Banjarsari	Lahat	43.5	3000	The majority of rubber and coffee farmers	Life in this village are farmers so that the majority of the income here is uncertain there are many unemployed
Banjarsari	Sukacinta - Banjarsari	Lahat	2.175	150	Farmers and Labor	Life in this village are farmers so that the majority of the income here is uncertain
Arahan Dusun II	Banjarsari - Muaraenim	Muaraenim	4.35	300	Farmers and Labor	average depends on agriculture and laborer on PT.KAI
Arahan Dusun I	Banjarsari - Muaraenim	Muaraenim	2.175	150	Farmers and Public Servant	average depends on agriculture and laborer on PT.KAI
Muara Lawai	Banjarsari - Muaraenim	Muaraenim	2.9	200	Farmers and Trader	Life in this village are farmers so that the majority of the income here is uncertain
Gunung Kem bang	Banjarsari - Muaraenim	Muaraenim	13.05	900	Farmers	Life in this village are farmers so that the majority of the income here is uncertain
Gedung Agung	Banjarsari - Muaraenim	Muaraenim	2.175	150	Farmers and Labor	Life in this village are farmers so that the majority of the income here is uncertain
Tungkal RT 3 RW 1	Banjarsari - Muaraenim	Muaraenim	2.9	200	Public Servant and entrepreneur	There are many unemployed

Tungkal RT 3 RW 2	Banjarsari - Muaraenim	Muara enim	1.45	100	Employees PT.KAI and trader	There are many unemployed
Tungkal RT 2 RW3	Banjarsari - Muaraenim	Muara enim	1.16	80	Employees PT.KAI and entrepreneur	The average they have fix income every month
Tungkal RT.01 RW 3	Banjarsari - Muaraenim	Muara enim	2.9	200	Employees PT.KAI, trader and junk collector	There are many occupations
Kelurahan Tungkal	Banjarsari - Muaraenim	Muara enim	7.25	5000	entrepreneur and Public servant	There are many occupations
Tungkal RT 3 RW 3	Banjarsari - Muaraenim	Muara enim	4.35	300	Trader and public servant	The average they are traders and there are public servant
Tungkal RT 1 RW 2	Banjarsari - Muaraenim	Muara enim	4.35	300	entrepreneur and Public servant	The average they are traders and there are public servant
Muara enim I	Banjarsari - Muaraenim	Muara enim	1.45	100	Trader and public servant	The average they are traders and there are public servant
Muara enim II	Banjarsari - Muaraenim	Muara enim	4.35	300	Trader and public servant	The average they are traders and there are public servant
Kelu rahan Muara enim	Banjarsari - Muaraenim	Muara enim	65.25	4500	entrepreneur and Public servant	The average they are traders and there are public servant
Gunung Ibul	Prabumulih - Lembak	Kotif Prabum ulih	1.45	100	Public servant, police Army	The average they have fix income every month
Sukajadi	Prabumulih - Lembak	Kotif Prabum ulih	3.625	250	Public servant, labor, trader, entrepreneur	The average they are entrepnreneur and public servant
Mangga Besar	Prabumulih - Lembak	Kotif Prabum ulih	5.075	350	Labor	Conditions were miserable most of the citizens are less capable

Pasar I Prabumulih	Prabumulih - Lembak	Kotif Prabumulih	4.35	300	a motorcycle driver, Labor and trader	Conditions were miserable most of the citizens are less capable
Cambai	Prabumulih - Lembak	Muara enim	2.9	200	Rubber Farmer	Life in this village are farmers so that the majority of the income here is uncertain
Kec.Cambai	Prabumulih - Lembak	Muara enim	5.8	400	Rubber farmer and labor farmer	Conditions were miserable most of the citizens are less capable the income is uncertain
Sukajadi Pemko	Prabumulih - Lembak	Muara enim	2.175	150	entrepreneur, labor, public servant	They have permanent house
Prabumulih timur	Prabumulih - Lembak	Muara enim	3.625	2500	Rubber farmer and labor farmer, public servant, etc	Conditions were miserable most of the citizens are less capable the income is uncertain
Sindur	Prabumulih - Lembak	Muara enim	2.9	200	The Majority are farmers and half public servant	Conditions were miserable most of the citizens are less capable the income is uncertain
Prabumulih Utara	Prabumulih - Lembak	Muara enim	3.987 5	275	Traders	they have income Rp. 1.000.000 every month
Kel. Pasar I	Prabumulih - Lembak	Muara enim	2.175	150	Traders	Conditions were miserable most of the citizens are less capable the income is uncertain
Karang Raja	Prabumulih - Lembak	Muara enim	3.045	210	Rubber farmer and labor farmer, public servant, etc	Conditions were miserable most of the citizens are less capable the income is uncertain
Lembak	Lembak – Karang endah	Muara enim	50.57	3500	Farmer and Labor	Conditions were miserable most of the citizens are less capable the income is uncertain
Lembak /Dusun I	Lembak – Karang endah	Muara enim	3.045	210	Rubber Farmer	Life in this village are farmers so that the majority of the income here is uncertain

Karangendah Utara	Lembak – Karangendah	Muaraenim	50.75	3500	Army and Farmer	Life in this village are farmers so that the majority of the income here is uncertain
Karang Endah Selatan	Lembak – Karangendah	Muaraenim	3.335	230	Farmer	Life in this village are farmers so that the majority of the income here is uncertain
Pangkul	Lembak – Karangendah	Muaraenim	4.06	230	Farmer and Labpr	Life in this village are farmers so that the majority of the income here is uncertain
Sigam I	Karangendah - Gelumbang	Muaraenim	2.175	150	Farmer and Labpr	Life in this village are farmers so that the majority of the income here is uncertain
Sigam III	Karangendah - Gelumbang	Muaraenim	2.175	150	farmer	Life in this village are farmers so that the majority of the income here is uncertain
Karangendah Utara	Karangendah - Gelumbang	Muaraenim	3.045	210	Farmer, trader vegetables	Life in this village are farmers so that the majority of the income here is uncertain
Gelumbang Rt2 Lingk 2	Karangendah - Gelumbang	Muaraenim	0.725	50	Public servant and farmer	Life in this village are farmers so that the majority of the income here is uncertain
Gelumbang Lingk 3	Karangendah - Gelumbang	Muaraenim	0.87	60	Trader and rubber farmer	Life in this village are farmers so that the majority of the income here is uncertain
Suka Menang	Gelumbang - Serdang	Muaraenim	1.8125	125	Farmer and Labpr	Life in this village are farmers so that the majority of the income here is uncertain
Talang taling	Gelumbang - Serdang	Muaraenim	56.9415	3927	Farmer, labor, trader	Life in this village are farmers so that the majority of the income here is uncertain
Paya kabung	Serdang - Payakabung	Ogan Ilir	2.9	2000	Farmer and Labor	Life in this village are farmers so that the majority of the income here is uncertain

Sei Ram butan	Payakabung - Simpang	Ogan Ilir	1.74	120	Farmer and Labor	Conditions were miserable most of the citizens are less capable the income is uncertain
Karya Jaya	Simpang - Kertapati	Palem bang	0.58	160	entrepreneur, farmer, labor, public servant, etc	Conditions were miserable most of the citizens are less capable the income is uncertain
Kemang Agung	Simpang - Kertapati	Palem bang	232	16000	entrepreneur, farmer, labor, public servant, etc	Conditions were miserable most of the citizens are less capable the income is uncertain
Ogan Baru	Simpang - Kertapati	Palem bang	174	12000	entrepreneur, farmer, labor, public servant, etc	Conditions were miserable most of the citizens are less capable the income is uncertain
Kertapati kelurahan	Area ABCD	Palem bang	143.376	9888	entrepreneur, farmer, labor, public servant, etc	Conditions were miserable most of the citizens are less capable the income is uncertain
Kertapati RT 18	Area ABCD	Palem bang	4.756	328	entrepreneur, farmer, labor, public servant, etc	Conditions were miserable most of the citizens are less capable the income is uncertain

6. Evaluation of Findings From Survey Results

(1) Identification of Affected Areas

The Project is for implementing double tracking works of the railway line from Suca Cinta to Kertapati and for constructing necessary installations for this Project in the areas annexed to Kdrtpati station.

Firstly, there construction works and installations will require the resettlement of numerous households in land areas for double traking works along the railway and constructing the related installations in the areas annexed to Kertapati station.

In the areas along the railway, the number of affected households is

estimated around 350 households at firsthand. In the areas annexed to Kertapati station, the number of affected households in these areas is estimated around 800 at the moment.

Besides, in the areas along the railway, by project implementation for having more daily trains in the Project Area, the most affected areas will be the areas of agglomerations (villages) around stations where inhabitants daily crossing the railway for going to work, market, school, clinic etc. The proper installations at these locations, therefore, will be securwd for safety for local inhabitants, particular children and aged people, when crossing the railway. Besides, the measures for lessening vibration, noise and dust causing nuisances to local inhabitants will be considered also.

In tha areas annexed to Kertapati Station, by project implementation for having more daily trains and coal stockyard as well as coal loading conveyor installation in the Project Area, due to the dense population in these areas, the affected areas, therefore, will be larger and more intensive. The measures for lessening vibration, noise and dust causing nuisances to local inhabitants, therefore, will be basically considered.

(2) Identification of Socio-Economic Impacts by Project Implementation

There are many kinds of socio-economic impacts resulted from the project implementation to the society along the railway Sukacinta - Kertapati and the areas around Kertapati Station,

The benefits and losses to local communities are evaluated as follows:

NO	AREA	BENEFIT	LOSS
1	Area Along Railway Sukacinta - Kertapati	a) Enhancing rolling stock b) Industry for PT. KAI or other related railway operations c) As well as the improvement for local passengers to access to schools,	a) Loss of community residences for more than 350 households b) The loss of livelihood or community gardens affected by the project c) The more distant daily activities people affected

		hospitals, market etc. d) The growth of coal mining industry, e) The increase in business opportunities in t	by the project
2	Area round Kertapati Station	a) Availability of a large coal stock yard in Kertapati station b) Availability of more jobs for local residents c) Will increase socio economic level community around the project	a) More air pollutions and noise b) Many communities around in project are will be resettled

(3) Surveys on Occupations and Incomes of Occupants

From the survey results that have been made ton average revenues and occupations of people residing around the railway line Sukacionta – Kertapati and Kertapati Station areas are farmers, workers, teachers, pensions, civil servants, railway employees.

The figures of their incomes are as follows

- a) Farmers income of occupants: minimum and maximum of approximately Rp. 500.000 and Rp.900.000
- b) Worker income of occupants: minimum and maximum of approximately Rp. 500.000 and Rp.900.000
- c) Teachers income of occupants: minimum and maximum of approximately Rp. 800.000 and Rp 2.000.000
- d) Pensions income of occupants: minimum and maximum of approximately Rp. 800.000 and Rp 2.500.000
- e) **Civil Servants income of occupants: minimum and maximum of approximately Rp. 1.000.000 and Rp 3.000.000**

- f) Railway employees income of occupants: minimum and maximum of approximately Rp. 800.000 and Rp 3.000.000

(4) Situation of Land Use in Project Area

At the time of the survey along the railway line Sukacinta - Kertapati and areas around Kertapati Station, the situation of land use in the project area is basically for agricultural use in areas along the railway and for habitation with business use in areas around Kertapati Station.

The majority of these land areas which occupants are now occupying are not theirs but belonged to the Government of the Republic of Indonesia/ Besides land use situation in the project area along the railroad tracks Sukacinta - Kertapati is home to the public, rubber plantations, oil palm plantations and other agricultural plantations.

Meanwhile in the areas around Kertapati station (Kertapati village) this land area of totally about 96 ha was previously a land area of forest and gardens. Administratively, this land belonged to landlords in the Dutch colonial period. Presently, there are about households with a traditional market along the main road Simpang Sungki., There are many graves in this area. This also the most busy business area around Kertapati Station because more than 117 shops could be found in this area. There is a mosque established since 1993 but no school and clinic in this area. The majority of residents in this Kertapati area have their income in one month average lower-middle, and a place of for various social activities . The area namely ABCD area of about 20 Ha annexed to the Depot of Kertapati station is subjected to new constructions of coal stockyard etc. has more than 700 households. The area nearby Organ River is widely used for Coal company stock Coal private and government-owned companies such as PT Indonesia. Semen Baturaja.

(5) Regional Governance and Organization

The situation of governance in the Project Area is as follows:

Section	Administration			
	Village	Sub-District	Regency / Municipality	Province
Sukacinta - Banjarsari	Sukacinta	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Lebak Budi	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Prabu Menang	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Kebur	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Tanjung Baru	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Muara Mau	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Sira Pulau	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Ulak Pandan	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Tanjung Jambu	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Negri Agung	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Tanjung Pinang	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Telantang	Merapi Barat	Lahat Regency	South Sumatera
Sukacinta - Banjarsari	Merapi	Merapi Barat	Lahat Regency	South Sumatera

Sukacinta - Banjarsari	Banjar sari	Merapi Barat	Lahat Regency	South Sumatera
Banjarsari - Muaraenim	Arahan Dusun II	Merapi Barat	Lahat Regency	South Sumatera
Banjarsari - Muaraenim	ArahanDusun I	Merapi Barat	Lahat Regency	South Sumatera
Banjarsari - Muaraenim	Muara Lawai	Merapi Barat	Lahat Regency	South Sumatera
Banjarsari - Muaraenim	Gunung Kembang	Merapi Barat	Lahat Regency	South Sumatera
Banjarsari - Muaraenim	Gedung Agung	Merapi Barat	Lahat Regency	South Sumatera
Banjarsari - Muaraenim	Tungkal RT 3 RW 1	Muara enim	Muara enim Regency	South Sumatera
Banjarsari - Muaraenim	Tungkal RT 3 RW 2	Muara enim	Muara enim Regency	South Sumatera
Banjarsari - Muaraenim	Tungkal RT 2 RW3	Muara enim	Muara enim Regency	South Sumatera
Banjarsari - Muaraenim	Tungkal RT.01 RW 3	Muara enim	Muara enim Regency	South Sumatera
Banjarsari - Muaraenim	Kelurahan Tungkal	Muara enim	Muara enim Regency	South Sumatera
Banjarsari - Muaraenim	Tungkal RT 3 RW 3	Muara enim	Muara enim Regency	South Sumatera
Banjarsari - Muaraenim	Tungkal RT 1 RW 2	Muara enim	Muara enim Regency	South Sumatera
Banjarsari - Muaraenim	Muara enim I	Muara enim	Muara enim Regency	South Sumatera
Banjarsari - Muaraenim	Muara enim II	Muara enim	Muara enim Regency	South Sumatera
Banjarsari - Muaraenim	Kelurahan Muara enim	Muara enim	Muara enim Regency	South Sumatera

Prabumulih - Lembak	Gunung Ibul	Prabumulih Timur	Prabumulih City Administrative	South Sumatera
Prabumulih - Lembak	Sukajadi	Prabumulih Timur	Prabumulih City Administrative	South Sumatera
Prabumulih - Lembak	Mangga Besar	Prabumulih Besar	Prabumulih City Administrative	South Sumatera
Prabumulih - Lembak	Pasar I Prabumulih	Prabumulih Besar	Prabumulih City Administrative	South Sumatera
Prabumulih - Lembak	Cambai	Cambai	Prabumulih City Administrative	South Sumatera
Prabumulih - Lembak	Kec.Cambai	Cambai	Prabumulih City Administrative	South Sumatera
Prabumulih - Lembak	Sukajadi Pemko	Sukajadi	Prabumulih City Administrative	South Sumatera
Prabumulih - Lembak	Prabumulih timur	Sukajadi	Prabumulih City Administrative	South Sumatera
Prabumulih - Lembak	Sindur	Cambai	Prabumulih City Administrative	South Sumatera
Prabumulih - Lembak	Prabumulih Utara	Prabumulih	Muara enim Regency	South Sumatera
Prabumulih - Lembak	Kel. Pasar I	Prabumulih	Muara enim Regency	South Sumatera
Prabumulih - Lembak	Karang Raja	Karang Raja	Muara enim Regency	South Sumatera
Lembak - Karangendah	Lembak	Lembak	Muara enim Regency	South Sumatera
Lembak - Karangendah	Lembak /Dusun I	Lembak	Muara enim Regency	South Sumatera
Lembak - Karangendah	Karangendah Utara	Gelumbang	Muara enim Regency	South Sumatera
Lembak - Karangendah	Karangendah Selatan	Gelumbang	Muara enim Regency	South Sumatera

Lembak - Karangendah	Pangkul	Gelumbang	Muara enim Regency	South Sumatera
Karangendah - Gelumbang	Sigam I	Gelumbang	Muara enim Regency	South Sumatera
Karangendah - Gelumbang	Sigam III	Gelumbang	Muara enim Regency	South Sumatera
Karangendah - Gelumbang	Karangendah Utara	Gelumbang	Muara enim Regency	South Sumatera
Karangendah - Gelumbang	Gelumbang Rt2Lingk 2	Gelumbang	Muara enim Regency	South Sumatera
Karangendah - Gelumbang	Gelumbang Lingk 3	Gelumbang	Muara enim Regency	South Sumatera
Gelumbang - Serdang	Suka Menang	Gelumbang	Muara enim Regency	South Sumatera
Gelumbang - Serdang	Talang taling	Gelumbang	Muara enim Regency	South Sumatera
Serdang - Payakabung	Payakabung	Indralaya Utara	Ogan Ilir Regency	South Sumatera
Payakabung - Simpang	Sei Rambutan	Indralaya Utara	Ogan Ilir Regency	South Sumatera
Simpang - Kertapati	Karya Jaya	Kertapati	Palembang Municipality	South Sumatera
Simpang - Kertapati	Kemang Agung	Kertapati	Palembang Municipality	South Sumatera
Simpang - Kertapati	Ogan Baru	Kertapati	Palembang Municipality	South Sumatera
Area ABCD	Kertapati Kelurahan	Kertapati	Palembang Municipality	South Sumatera
Area ABCD	Kertapati RT 18	Kertapati	Palembang Municipality	South Sumatera

(6) Situation of Social Infrastructures

Section	Social Infrastructures				
	Electric	Water	School	Clinic	Mosque
Sukacinta - Banjarsari	yes, from the state electricity company	yes from river and water wells	yes, built by the government and local communities	yes, administered by paramedics from the local health	yes, built and managed by local communities
Banjarsari - Muaraenim	yes, from the state electricity company	yes from river and water wells	yes, built by the government and local communities	yes, administered by paramedics from the local health	yes, built and managed by local communities
Prabumulih - Lembak	yes, from the state electricity company	yes from river and water wellswater companies	yes, built by the government and local communities	yes, administered by paramedics from the local health	yes, built and managed by local communities
Lembak – Karang endah	yes, from the state electricity company	yes from river and water wellswater companies	yes, built by the government and local communities	yes, administered by paramedics from the local health	yes, built and managed by local communities
Karang endah - Gelumbang	yes, from the state electricity company	yes from river and water wells	yes, built by the government and local communities	yes, administered by paramedics from the local health	yes, built and managed by local communities
Gelumbang - Serdang	yes, from the state electricity company	yes from river and water wells	yes, built by the government and local	yes, administered by paramedics from the local	yes, built and managed by local communities

			communities	health	
Serdang - Payakabung	yes, from the state electricity company	yes from river and water wells	yes, built by the government and local communities	yes, administered by paramedics from the local health	yes, built and managed by local communities
Payakabung - Simpang	yes, from the state electricity company	yes from river and water wells	yes, built by the government and local communities	yes, administered by paramedics from the local health	yes, built and managed by local communities
Simpang - Kertapati	yes, from the state electricity company	yes from river and water wells water companies	yes, built by the government and local communities	yes, administered by paramedics from the local health	yes, built and managed by local communities
Area ABCD	yes, from the state electricity company	yes from river and water wells water companies	yes, built by the government and local communities	yes, administered by paramedics from the local health	yes, built and managed by local communities

(7) Situation of Social Services

Section	Social Service				
	Electric	Water	School	Clinic	Mosque
Sukacinta - Banjarsari	good, it functions properly	good, used for drinking and washing and other cooking	good, works fine for teaching and learning process	good, as health care for all ages	good, function as a place of worship of Muslims and other social activities center

Banjarsari - Muaraenim	good, it functions properly	good, used for drinking and washing and other cooking	good,works fine for teaching and learning process	good,as health care for all ages	good,function as a place of worship of Muslims and other social activities center
Prabumulih - Lembak	good, it functions properly	good, used for drinking and washing and other cooking	good,works fine for teaching and learning process	good,as health care for all ages	good,function as a place of worship of Muslims and other social activities center
Lembak – Karang endah	good, it functions properly	good, used for drinking and washing and other cooking	good,works fine for teaching and learning process	good,as health care for all ages	good,function as a place of worship of Muslims and other social activities center
Karang endah - Gelumbang	good, it functions properly	good, used for drinking and washing and other cooking	good,works fine for teaching and learning process	good,as health care for all ages	good,function as a place of worship of Muslims and other social activities center
Gelumbang - Serdang	good, it functions properly	good, used for drinking and washing and other cooking	good,works fine for teaching and learning process	good,as health care for all ages	good,function as a place of worship of Muslims and other social activities center

Serdang - Payakabung	good, it functions properly	good, used for drinking and washing and other cooking	good,works fine for teaching and learning process	good,as health care for all ages	good,function as a place of worship of Muslims and other social activities center
Payakabung - Simpang	good, it functions properly	good, used for drinking and washing and other cooking	good,works fine for teaching and learning process	good,as health care for all ages	good,function as a place of worship of Muslims and other social activities center
Simpang - Kertapati	good, it functions properly	good, used for drinking and washing and other cooking	good,works fine for teaching and learning process	good,as health care for all ages	good,function as a place of worship of Muslims and other social activities center
Area ABCD	good, it functions properly	good, used for drinking and washing and other cooking	good,works fine for teaching and learning process	good,as health care for all ages	good,function as a place of worship of Muslims and other social activities center

(8) Indigenous Groups

In the ancient times of Indonesia. Sumatra was a wild land with some indigenous people of Polynesian origins. However, after the occupation and development by the Dutch for socio-economic development purposes with large plantations and regional infrastructures since the 1800s, the indigenous people who preferred a wild life had left these ground areas for moving to the Western mountainous regions.

However, as this region is a hub place for marine traders in the region,

many kinds of people in the South Asian Region as well as from Jawa island and Malaysia came to this giant island at Palembang for making trading and living, making up native people in this island for more than a thousand years ago. Also, the Chinese immigrants had come to live in this island since the old times.

Afterwards, Ogan River, a tribute of Musi River, was used to transport residents to run their economic lives of some local merchants came to the area of Kertapati to start trading business with local residents, native people of Palembang, whom are from ethnic Javanese, Padang, Bugis and Chinese immigrants. After a while then finally decided to stay together and built their lives in this land until now.

Initially the area around the station of Kertapati was an environment inhabited but for those who were temporally employed by PT. Indonesia Railways. There was an area called Depot, the area was once inhabited by the majority of employees of PT. Indonesia Railways and their derived family members from the Javanese. Formerly they were as landless migrants and shelters, but due to works employed by PT. Indonesia Railways, they finally made a place to live near their work place environment.

After retirement from works for PT.KAI, these PT.KAI workers and their descendants have continued living there with their houses constructed in the areas even though they did not work at PT. Indonesia Railways anymore. They do not want to move to another place from their homes. The same thing happened in the Prabumulih, Muara Enim and Sukacinta areas.

Formerly, the area around the railway line was inhabited but lately a resident area for those who worked at PT. Indonesia Railways and now by people with various professions and settlers who have constructed illegal buildings around this station The people living in the Project Area, therefore, are mostly the descendants of PT.KAI workers as well as people moving from othe places for making business in the areas.

(9) Underpriviledged Groups

In areas around the railway, the local people with a variety of life. There is a relatively healthy people, they usually go for works as daily laborers with

an uncertain income. They cannot meet the needs of daily life even though they have been working all day. This could be considered as the underprivileged group in the Project Area.

With unhealthy housing conditions, many of those affected by infectious diseases because of their poor living environment. Their living conditions are very worrying. For those who live near the river they use river water for their daily living of bathing, waste water up to drinking. This leads to people vulnerable to infectious diseases because they do not keep clean. Not to mention the waste carelessly discarded because there was no garbage disposal so that they are often called the slum environment.

In addition there are residents who live just rely on income from selling mats they make themselves from pandan leaves, some are made from palm leaf roofs. They lack skills for this job or other skills to earn money in order to meet the needs of everyday life. They live in groups with friends who have the same situation. They have looked for the leaves in the jungle nearby their homes and then made something from these leaves so that they could sell for making money to buy foods for everyday.

With this project, implementation the community hopes that the Project can help boosting the economy. The Project may enter into vocational education for the local people so they can develop their business to improve their lives so that they earn a decent living. Residents can be developed to gain additional skills and be given a loan for the development of their businesses, so they can create new jobs and reduce the unemployment situation.

As in a Muslim society, the daily life of aged and handicapped people in the Project Area is found largely relied on the charity activities of local mosques. Basically, they are properly taken care by the local communities.

(10) Historic and Cultural Heritages

Historically, there are no heritages of archaeological objects in the environment around the railway line. But not far from the railway at the station of Kertapati there was a pemakamam (common graveyard) constructed around 1937. This cemetery was originally a family cemetery but over time this area turned into a public cemetery. The land area of 1 hectare for sekitas funeral was very close to human settlements coming to live in this area..

Presently, the existing residential area is quite densely populated. They live in a cramped condition with neighbors and a public cemetery. Local residents do not feel afraid to live nearby the cemetery, they are already familiar with it, even their children allowed to play near the cemetery area. The actual burial ground including soil PT. Indonesian Railways, but residents who already live and stay in the area do not want to leave even though they actually do not have permission to live in the area.

If the construction project is implemented in this are, the cemetery is subjected to be demolished. This would require proper execution to avoid conflict with local people in the area.

(11) Gender Matter

First, this Project will provide a broad impact to the lives of the citizens who live and have plantations around this railway line. Actually, residents who live near this railway line have a wide range of jobs. Most men who have worked day by day in the farms and gardens from early morning until late afternoon. Women sometimes helped works in farms and backyard gardens but their daily works are basically house keeping, cooking and taking care for their children at home. In some places women are not working to earn salary payments but just selling garden produces in front of their houses. Also some of family members of PT.KAI employees work as farm laborers and casual laborers in the nearby areas.

As men, women are going to mosques for praying but women associations are found essentially lacking in the areas, causing no periodical gatherings for group activities for women, except for the cases of festival occasions. If their houses and gardens will be evicted then the affected people expect to be given a proper relocation place to for living and working to earn revenues. For example residents who had been hoping to sell a new place to continue his efforts. The men who demolished the garden will need a new job and if there are gardens so they need adequate transportation to get to their gardens.

Women and children are also affected by this project implementation, particularly for the largely affected areas around Kertapati Station and major stations of this railway line . For those who will be relocated in places far from

health care centers, schools etc., this project has to consider for finding health center, new school etc.for the children of affected people.

Policy of gender-sensitive public service is required to equalize a chance, opportunities and facilities for men and women. Gender issues need special attention include the development of railway transport. If it should be relocated so they hope to relocate in a place that has a fairly good infrastructure facilities. Residents in the affected areas hope this relocation to be socialized at least 1-2 years in advance so that they can prepare themselves and find a proper relocation place to carry on their lives. Especially for men who work as farmers, they will seek new farmland to continue their work as farmers.



Women crossing the railway at
Karyajaya



The railway at Karyajaya



Double Musi II Bridge



Double Musi II Bridge



People dare to cross the railways at Karyajaya



Motorcycle bring tools across the railway at Karyajaya



Student go home through the railway At Karyajaya



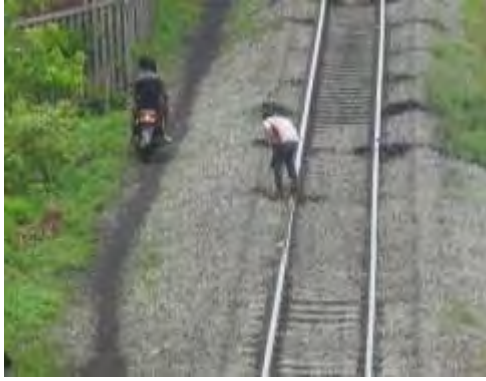
Student walking at the railway back at home



Student play at the railway after finished the study



Student walking and talking at the railway



People take the stone from the railway



One of the small shop in front of the railway



Motorcycle accros the railway



Women walking around the railway

(12) Children Matter

Children are the fruit of marriage for making a family. The baby will become the future human resource for the task of continuing struggle of the nation in realizing the ideals of the nation. Children, therefore, basically have rights that must be met by the family of his parents. As a matter of fact, children have rights include the rights for having welfare, protection, care and guidance. Nearly 99.9% of residents living near the railway area does not have a decent playground for children. In comparison to the actual situation of most houses being constructed pretty solid, the children in the areas grow and thrive in conditions of considerable concerns. Coupled with the lack of facilities for child development, other educational facilities are still a mediocre situation.

In the environment around the railway there are also mother and child health center, or better known by Posyandu. Integrated Service Post serves a treatment for mother and child. This integrated health conditions are very simple with a medicare facilities and only provide a crude treatment. If there is a case of serious mother / child illness, the patient will be transferred immediately to the hospital nearby.

In addition there are also educational facilities such as Education for Early Childhood (1-3 years) and elementary school. For the area around the station with a crowded home environment so that children have no playground, so they prefer to play around the edge of the rail road. It is actually endanger their safety, but parents can not do much because there is no playground facilities in the environment around them.

Sometimes the children were found playing by throwing stones towards trains passing in the areas. These children grow up in an environment that is unhealthy and not conducive. Their parents mostly have no sufficient educational background and often live in poor conditions. It also affects the pattern of parental education on children.

Coupled with the environmental conditions that are not feasible (such as the ABCD area), giving rise to poor social behavior in the future. If only there was an adequate place to play and a healthy living environment, so these children can grow and develop into a better person.



Boy drive bicycle near the railway



Boy after finished the study



Student play near the railway



Student play near the railway look for the stone



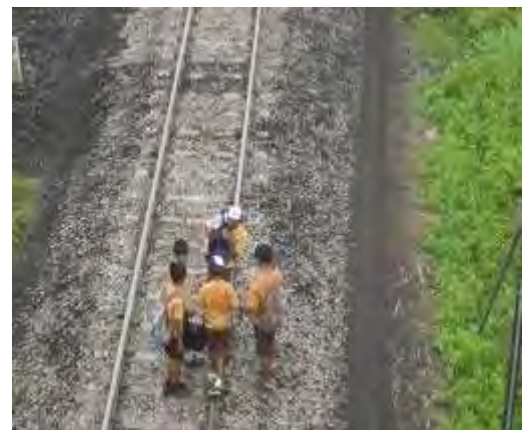
At Kelurahan Keramasan



Children play near the railway



Boys walking at The railway



Boys talking at the railway



The boys around the railway



The Boys around Keramasan



Area Nilakandi



Coal Wagon at Kertapati



The street at Keramasan



Area ABCD



House near the railway at Kertapati
Station yard



Area ABCD



Children play in the area Kertapati
Station



Children who lived near the railway



People walking at Dipo Area



The Boys Plays at Dipo Kertapati



Storage/Workshop of PT.KAI



Accrossing Bridge in the Kertapati Station



At the bridge in Kertapati Station



The girls down from the bridge

(13) Social Conflicts

Concerning this matter, some major social conflicts had occurred previously when the transition of government power from the New Order government to the Era of Reform. The New Order government deemed to have committed corruption collusion and nepotism, and no longer gave priority to the interests of the people. Society demands a change that can transform people's lives much better. In the New Order period of unemployment increases every year, meanwhile land and job were found much more narrow, causing high rates of crimes and public unrests.

The peak occurred on 10 - May 14, 1998 where there were riots / rage against the New Order government. As an expression of anger then the stores are managed and owned by ethnic Chinese / tionghoa burned and selling their

goods stolen. This happens in the market environment Kertapati not far from the station Kertapati. The entire Chinese Ethnic / tionghoa who reside in the area around Kertapati save themselves by leaving their houses and shops. Their stores were vandalized and their goods were stolen by people who took advantage of the opportunity at the time of overthrowing the New Order government.

The demonstrators blocked roads and burned cars considered to be owned by citizens of Chinese descent / tionghoa. This is done because it was at that time ethnic chinese / tionghoa mastering Indonesia's economy and the state monopoly system of trade in Indonesia. so that indigenous peoples can not thrive and the economy worse off. This conflict could lead to economic conditions the country is very unstable so as to make people more miserable.

After a few months later when circumstances gradually to normal then the ethnic chinese / tionghoa re-build their lives and still be able to interact properly with indigenous peoples to the present. In areas nearby the railway there are some houses / shops that do inhabit the ethnic chinese / tionghoa.

However, to this day, they can coexist peacefully with the natives. And now conflicts between racial / ethnic will never happen again, especially in South Sumatra.

(14) Infection Diseases

Diesel engines presently used by train locomotives in this railway line often generate toxic exhaust emissions. Carbon monoxide gas which is the remainder of incomplete combustion of the locomotive engine that can bind to hemoglobin in the blood, leading to shortness of breath due to the oxygen distribution is not smooth. Besides, passing trains also cause loud noise and vibration with very high intensity to the nearby areas. Not to mention when trains passing through crossings with roads, locomotive horns make a deafening sirene sound which may cause hearing loss to some people living nearby these locations.

As being known, the railroad is basically a toilet for the passenger trains because these trains do not have toilets equipped with containers. To 'disguise' the dirt being scattered along the tracks, toilets may be used only when trains running. Urine and feces with bacteria and other germs, including worm eggs,

along the railway, therefore, could cause diseases of digestive disorder, particularly by bacteria from infected human feces. People living around the railway areas, therefore, has basically an unhealthy living environment. Residents in the sections of Kertapati - Simpang and Sukacinta – Muaraenim cited that diarea is very often happened in the areas.

In the area Kertapati – Simpang, numerous factories such as cement, rubber, coal etc. have been found. Local communities are often exposed to pollution resulting from operations of these factories.

In general, the situation of air pollution is a major problem for the human respiratory tract, causing nasal cilia movement becomes slow and stiff with the respiratory tract irritation caused by pollutants. Mucus production will increase, causing narrowing of the airways and destruction of bacteria-killing cells in the respiratory tract. This will cause the difficulty in breathing that attracted foreign objects and other bacteria can not be expelled from the respiratory tract. This situation will facilitate the occurrence of respiratory tract infections.

Acute Respiratory Infections (ARI) are the major diseases attacking the surrounding communities. It is widely experienced by small children in the area. Every day these kinds of dust from the railway areas fly into the houses of residents living around, triggering respiratory diseases. Symptoms begin with shortness of breath. In addition to ARI, Dengue fever transmitted from mosquitoes cause outbreaks time to time that claimed the lives of many people especially children.

However, about the situation of bird flu (H5N1) or STD (sexual transmitted diseases) happened in the areas, there are no reports on serious transmittals or outbreak cases up to now.

(15) Labor Environment

Diesel engines used by most railroad locomotives generate toxic exhaust emissions. Carbon monoxide gas which is the remainder of incomplete combustion of the locomotive engine that can bind to hemoglobin in the blood, leading to shortness of breath due to the oxygen distribution is not smooth. No doubt about it, pacing trains that pass noise with very high intensity. Not to mention if it will pass through the crossing with the highway, locomotive horn will sound a deafening sound and if it happens constantly can lead to hearing

loss.

As is known, the railroad was basically a toilet for the longest train that crossed it does not have a toilet equipped with a container of dirt. To 'disguise' the dirt being scattered along the tracks, toilets may only be used when the train runs. Urine and feces containing bacteria and other germs, including worm eggs could be found spreading in the railway areas.. .

Therefore, one of the risk of people living along the railroad tracks is a digestive disorder caused by bacteria from infected human feces. People who live around these areas have bèn always confronted to an unhealthy environment. In the area Kertapati – Simpang there are numerous factories such as cement, rubber, coal and so on. Communities in these areas are often exposed to pollution resulting from activities carried out by these factories.

In general, the effects of air pollution on the respiratory tract can cause nasal cilia movement becomes slow and stiff can even stop so it can not clean the respiratory tract irritation caused by pollutants. Mucus production will increase, causing narrowing of the airways and destruction of bacteria-killing cells in the respiratory tract. As a result of this causes difficulties in breathing by attracting foreign objects and bacteria cannot be expelled from the respiratory tract. This will facilitate the respiratory tract infections.

Acute Respiratory Infections (ARI) gave been considered as the major diseases that attack the surrounding communities. It is widely experienced by their small children. Every day the dust flying into the houses of local residents, triggering respiratory diseases. They suck this air containing dust from cement and rubber factories and coal. Not only children, adults have been infected as well by many respiratory diseases. Symptoms begin with shortness of breath. In addition to ARI disease dengue fever outbreak time to time, claiming the lives of many people especially children

(16) Needs for Compensations and Assistances for Resettlement

Residents subjected to resettlement want compensation in accordance with the level of their losses. Some residents have asked for relocated in existing estates so that they can continue their work as farmers. There are also residents who want compensation in the form of money which a quantity is

calculated based on the sale of the object affected by the relocation, the price adjusted to current prices.

For citizens who own land elsewhere may not be experiencing difficulties at the time of relocation, they only ask for compensation in the form of money whose value adjusted to current prices . But for residents who do not have anything other than house and land occupied by the current, they worry about where to look for new dwellings. Residents do not mind the relocation resolved only they fear relocated far away from infrastructure, making it hard for the activities of their social lives everyday.

In some areas, residents agree on relocation resolved'm not far from their place of business during this time. For those who work as traders hoped that the relocation area can later be used as a trade so that they do not lose their livelihood everyday. Besides existence of the infrastructure needs to be taken into consideration to find the area of relocation. Hospitals, schools, markets and places of worship into things that can not be separated from a community that is in a particular area. Most residents want relocated in the area that has a complete infrastructure and can easily reach for them.

This project is not expected to negatively impact big enough for all citizens who reside in the area of the railway. Relocation should be considered carefully so as not to cause social conflicts in the future at the time of the actual relocation.

7. Identification of Major Impacts and Problems

This project implementation has a broad enough impact to the surrounding communities. There are both positive and negative impacts to their living conditions.

1. Positive Impact:

- ❖ Provide added value of business and work in communities, particularly communities around major stations of this railway line, to enable them to improve the family economy by contributing to improved family revenues by more work opportunies from this project implementation.

- ❖ Provide new jobs for local people and this project is expected to reduce unemployment. Accordance with applicable government regulations now establish that if an industry or a company then there should be approximately 60% of local residents are given the opportunity to participate in the activities of the company.
- ❖ Provide more convenient communications by more passenger trains running in the region, particularly to the major cities such as Palembang, Prabumulih, Lahat etc for nes business and work opportunities.

2. Negative Impact:

- ❖ For affected households, residents must leave their homes, farms and businesses. They bear an impact from loss of their livelihood everyday. They have to find new land and homes to continue their lives. For those who have business nearby their home, they have to lose their business and have to seek new ventures in the new places.
- ❖ If the relocation is in remote places being quite far from the city areas, then they need transportation, which means the cost of transport to get to work, school, hospital, etc.
- ❖ Residents need to adapt to the new living environments in relocation places. This would take a long time.

8. Preliminary Estimation of Compensation for Resettlement

In the estimation of compensation for the resettlement of people affected by the project requires the calculation of a clear and transparent and seek to promote deliberation and consensus in terms of both change and other pecuniary benefit or a problem penempatan population affected by the project to where they will be addressed in accordance with the agreement along with involving people affected by the project, local governments and implementers of the project, so that the implementation of the project running smoothly

9. Proposed Mitigation Measures

From the survey results that have been done so far, it can be proposed some measures for mitigating the negative impacts from the project. implementation The proposed measures are the following actions:

- ① Determine the ideal distance for the construction project is between project areas with neighborhood residents for preventing any disruptions to the living conditions of local people.
- ② To reduce the nuisances from the stockpile areas by installing concrete enclosures to muffle the sound, dust etc. disturbing the surrounding communities.
- ③ Before discharging the waste water into the river, the first retention pond / settling to do filtering in order to reduce the impact of water pollution must be installed.
- ④ To reduce dust in the stockpile areas by watering as often as possible to prevent dust damaging the health of local people. This can be done by using Supreyor or water fog.
- ⑤ There is a need to planting trees in areas along the railway to reduce flying debris. It is necessary to have a cooperation with local people for preserving the environment by planting trees.
- ⑥ Transporting coal shall be made with proper containers and conveyor that do not cause bad impacts to the living environment of local people.

10. Proposed Measures for Improvements in Living Conditions

From the results of surveys on the actual living conditions of residents in the Project Area, then with the project implementation, some measures are proposed to be carried out from step to step for improving their living conditions as follows:

- Provide adequate relocation site for residents to seek the relocation of a neighborhood not far from their jobs during this time.
- Build a modest home that meets national health standards for the relocated residents.

- Participates maintain and keep good relations with residents around the project.
- Give a better Contribution to the citizens who lost their jobs by engaging citizens to work in the project.
- Establish facilities and adequate infrastructure such as health centers, schools, mosques and market to facilitate social activity of local people.
- Establish a non-governmental organizations to provide an educational skills to local people and assist the development of small and medium enterprises to increase the economy of the people

11. Proposed Measures for Improvements in Environmental Aspects

These things can be done to improve the environment are as follows:

- Seeking a source of clean water is essential for the survival of local people.
- Creating a Water Treatment to water used for drinking citizens of good quality so as not to adversely affect health. With water treatment water can be consumed without having to worry about the impact after consuming water.
- Make the irrigation / drainage system is good for people who have gardens and farms, gardens and farms that can grow and develop properly.
- Development of a wash and bath installation as well as public lavatories in accordance with national health standards.
- For a dense residential area, the fire road will be made for cases of fire.
- Provide lighting for street lamps and electricity to homes around the project.
- Invite local residents to form neighborhood security system by setting up neighborhood security outposts.
- Citizens together working with the city sanitation department for making a proper waste collection and treatment system for maintaining a healthy

environment.

12. Proposed Measures for Improvements in Social Aspects

The following aspects can be done to improve the environment social aspects in the Project Area.

- a. Seeking a source of clean water for local people in each area.
- b. Creating a Drinking Water Treatment plant in each residential areato for giving local inhabitants a good water quality to be consumed without worries about the impacts of contamination and infection.
- c. Constructing irrigation / drainage systems in the areas having gardens and farms,.
- d. Development of proper public lavatories in accordance with national health standards.
- e. For dense residential areas, it is necessary to have the fire road for operations in case of fire.
- f. Providing lighting for street lamps and electricity connection to homes
- g. Inviting local residents to form neighborhood security system by setting up neighborhood security outposts.
- h. Citizens together with the city sanitation department.establish and operate a collection and treatment of wastesto maintain a healthy environment in the areas.
- i. Reducing dust in the area of stockpile watering should be done as often as possible so that water does not continue to increase the production of dust and damage the health of local people. This can be done by using apparatus known as Supreyor or water fog.
- j. Planting trees to reduce flying debris, it is necessary for cooperation with local people together to preserve the environment by planting trees.
- k. Transporting coal by using proper containers and at time without disturbing living activities of local communities.

13. Conclusion and Recommendation

Conclusion

From the survey results have been obtained so far, some basic conclusions can be drawn as follows:

- a. From the data obtained, from survey work, the people living in the project area have a wide range of job. Some are workers or retired employees of PT. Indonesia Railways (Limited). Most families living as farmers, day laborers and others.
- b. Residents will not mind if being subjected to resettlement because their homes and estates will be affected by this project but they are requesting compensations by the amount of money in accordance with the economic conditions at the present time. Some residents agreed to ask for relocation sites but having concerns about the infrastructure and work environment in relocation sites. They wish also to sell things at the new places so that they could continue their business operations.
- c. If the project is implemented, it is hoped that local residents be involved in the project so that they get a job to support the economy of their families.
- d. The project has a considerable impact for the environment, because the construction of the stockpile for coal nearby Kertapati station areas. This will increase air pollution and pollution for the living environment of local people.

Recommendation

From the conclusion mentioned above, in order to make the project implementation could be carried out safely and under control, we recommend the following actions to be properly implemented accordingly:

- The resettlement program must be notified to the local people at least 1-2 years before so that residents can have sufficient time for preparing to be relocated. It must first be socialized with people affected by this project.
- Reduce the noise and dust from the coal stockpile to be constructed nearby Kertapati station by making a concrete enclosure to muffle the sound so as not to disturb the surrounding communities.
- Construct retention ponds for waste water treatment before the waste water being discharged into the river nearby.

- Provide adequate relocation sites for residents who seek relocation in a neighborhood not far from their actual working places.
- Give a better opportunity for those who lost their jobs by resettlement reasons by giving them jobs in the project.
- Establish facilities and adequate infrastructure such as health centers, schools, mosques and markets to facilitate the daily social activities of local people.
- Establish a non-governmental organization to provide educational skills to local people and to assist the development of small and medium enterprises to increase the incomes of local people.



Tema Puskopka with Team JICA
At Mariana Banyuasin



Survey Area at PTBA Location



Around Musi River



In front of Training Center at Mariana



Socialization at Area ABDC Kertapati



Members of Socialization



Puskopka Team & JICA giving advice



Discussion and sharing with audience



People at Socialization At Griya Sriwijaya



People listen to the presentation from the Team



Local government at Socialization



Puskopka & JICA Team



People listening the presentation at Griya Sriwijaya



Local government and people at Kertapati area



Interview with people at Area ABDC



Finishing final report at PUSKOPKA office



Mr. Abe & Mr. Hara collecting data



Finishing survey report



Nilakandi Bridge



The railway at Karyajaya



Houses to be affected by the project



Railway line at Keramasan Area



Situation around railway at
Keramasan



House on the edge of the rail road



transporting coal trains crossing in
the railway area keramasan



transporting coal trains crossing in the
railway area keramasan



transporting coal trains crossing in
the railway area keramasan



transporting coal trains crossing in the
railway area keramasan



transporting coal trains crossing in the railway area keramasan



transporting coal trains crossing in the railway area keramasan



railroad employee was repairing the damaged railway



railroad employee was repairing the damaged railway



Small shop near the railway



railroad employee was repairing the damaged railway



Railway crossings at Keramasan



railroad employee was repairing the damaged railway



Railway crossing at Kertapati



passenger trains were passing on the railway line



emplacement Kertapati station



Small shop near the railway



Stockpile PT.BAU



Houses near the railway line at
Keramasan



Area coal Stockpile



Situation at coal stockpile



PT.BAU Stockpile



boiler fuel transporters



Area Stockpile near Kertapati Station



Houses near the railway



Situation at Stockpile area



boiler fuel transporters



Houses near the railway at Kertapati Station



Situation near the railway line



boiler fuel transporters



Situation at stockpile



Stockpile PT.BAU



Stockpile PT.BAU

INVENTORY 1: INVENTORY OF SOCIO - ECONOMIC CONDITIONS OF VILLAGES IN PROJECT AREA

Section	Location	Survey Village	Number Of Houses	Village Population	Main Occupations	Land Use Situation	Social Infra Situation	Living Conditions	Indigenous People	Existence Heritages	Project Impacts
Sukacinta - Banjar Sari	Sukacinta	IOV - 12	375	1500	Farmers and Public servant	Land use for Living and Plantation Owned by PT.KAI	pretty good, there are some social such as farmer group and Karang Taruna for young people, religious groups	The majority are farmers and civil servants, the average monthly income of Rp. 1.500.000, the average education level is Senior High School	about 10 people are immigrants	-	Reduce traffic accidents
	Lebak Budi	SRV - 12	75	400	Farmers	Land use for Plantation Owned by PT.KAI	pretty good, there are some social such as farmer group and Karang Taruna for young people	Life in this village are farmers so that the majority of the income here is uncertain	about 3% are immigrants	-	Rubber plantations and coffee that we will have displaced
	Prabu Menang	SRV - 16	200	1000	Farmers	Land use for Plantation Owned by PT.KAI	pretty good, there are some social such as PKK for house wife and Karang Taruna for young people	Life in this village are farmers so that the majority of the income here is uncertain	1 family are immigrant	-	Loss a job and house
	Kebur	SRV - 11	50	250	Farmers and Labor	Land use for Plantation Owned by PT.KAI	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	at current prices of rubber and coffee are down so that the economic citizens also fell	The average is a native	-	This project is so damaging to the village because they could lose the rubber and coffee plantations
	Tanjung Baru	SRV - 13	80	475	Farmers and Labor	Land use for Plantation Owned by PT.KAI	pretty good, there are some social such as farmer group and Karang Taruna for young people	Life in this village are farmers so that the majority of the income here is uncertain	The average is a native	-	Loss plantation and house
	Muara Mau	SRV - 14	20	1200	The majority of rubber and coffee farmers	Land use for Plantation Owned by PT.KAI	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	15 household are immigrants	-	This project make them loss their houses
	Sira Pulau	SRV - 17	700	3000	Rubber Farmers	Land use for Living house	Social relations is quite good, there are some social groups such as PKK, Karang Taruna,etc	Life in this village are farmers so that the majority of the income here is uncertain	5 people are immigrants	-	This project make them loss their houses
	Ulak Pandan	IOV - 11	1200	5000	Farmers and Trader	Land use for Plantation Owned by PT.KAI	Social relations is quite good, there are some social groups such as PKK, Karang Taruna,etc	at current prices of rubber are down so that the economic citizens also fell	300 residents are newcomers	-	Loss Plantation
	Tanjung Jaribu	HGV - 15	250	1000	Rubber Farmers and Labor	Land use for rubber Plantation and business Owned by PT.KAI	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers and labor the majority of the income here is uncertain	-	-	Loss Plantation and Job
	Nagri Agung	HGV - 12	800	2000	Farmers and Trader	Land use for rubber & coffee Plantation and business Owned by PT.KAI	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers and labor the majority of the income here is uncertain	-	-	Loss Plantation and Job
	Tanjung Pnang	HGV - 11	900	3600	Farmers	Land use for Plantation Owned by PT.KAI	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	economy in these villages rely on agricultural products	200 HH are immigrants	-	Loss Plantation
	Telantang	HGV - 13	200	800	The majority of rubber and coffee farmers	Land use for Plantation Owned by PT.KAI	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	5 Household are immigrants	-	This project make them loss their houses
	Merapi	IOV - 13	1000	3000	The majority of rubber and coffee farmers	Land use for Plantation Owned by PT.KAI	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain, there are many unemployed	5 Household are immigrants	-	This project make them loss Plantation
	Banjar sari	HGV - 16	40	150	Farmers and Labor	Land use for Plantation Owned by PT.KAI	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	They all native	-	This project make them loss Plantation and house

Section	Location	Survey Village	Number Of Houses	Village Population	Main Occupations	Land Use Situation	Social Infra Situation	Living Conditions	Indigenous People	Existence Heritages	Project Impacts
Banjar Sari - Muara Enim	Arahan Dusun II	SRV - 15	70	300	Farmers and Labor	Land use for Plantation Owned by PT.KAI	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	average depends on agriculture and laborer on PT.KAI	They all native		This project make them loss Plantation and Job
	Arahan Dusun I	SRV - 20	30	150	Farmers and Public Servant	Land use for living and Plantation Owned by PT.KAI	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	average depends on agriculture and employees on PT.KAI	They all native		Loss their house
	Muara Lawai	IOV - 14	50	200	Farmers and Trader	Land use for Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	Many Newcomers	-	Loss Their Plantation
	Gungung Kembang	IOV - 15	225	900	Farmers	Land use for Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-	-	Loss Their house
	Gedung Agung	HGV - 14	50	150	Farmers and Labor	Land use for Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	They All native		Loss their rubber plantation and land for farm
	Tungkal RT 3 RW 1	IOV - 18	70	200	Public Servant and entrepreneur	Land use for Living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	There are many unemployed	They all native		Loss their house
	Tungkal RT 3 RW 2	IOV - 19	30	100	Employees PT.KAI and trader	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	There are many unemployed	They all native		Loss their house
	Tungkal RT 2 RW3	IOV - 17	20	80	Employees PT.KAI and entrepreneur	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	The average they have fix income every month	They all native		Loss their house
	Tungkal RT.01 RW 3	SRV - 18	70	200	Employees PT.KAI, trader and junk collector	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	There are many occupations	They all native		Loss their house
	Kelurahan Tungkal	IOV - 16	1500	5000	entrepreneur and Public servant	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	There are many occupations	25 house hold are immigrant		Loss their house
	Tungkal RT 3 RW 3	HGV - 18	55	300	Trader and public servant	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	The average they are traders and there are public servant	5 household are immigrant		Loss their house
	Tungkal RT 1 RW 2	HGV - 19	80	300	entrepreneur and Public servant	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	The average they are traders and there are public servant	They all native		Loss their house
	Muara enim I	HGV - 20	30	100	Trader and public servant	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	The average they are traders and there are public servant	They all native	Makam Kramat Puyang Bujang	Loss their house
	Muara enim II	SRV - 19	75	300	Trader and public servant	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	The average they are traders and there are public servant	25 household are immigrant		Loss their house
	Kelurahan Muaraenim	HGV - 17	1500	4500	entrepreneur and Public servant	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	The average they are traders and there are public servant	They all native		Loss their house

Section	Location	Survey Village	Number Of Houses	Village Population	Main Occupations	Land Use Situation	Social Infra Situation	Living Conditions	Indigenous People	Existence Heritages	Project Impacts
Prabumulih - Lembak	Gunung Ibal	HGV - 8	28	100	Public servant, police Army	Land use for living	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	The average they have fix income every month	They all native		Loss their house
		HGV - 7	53	250	Public servant, labor, trader, entrepreneur	Land use for living	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	The average they are entrepreneurship and public servant	They all native		Loss their house
		HGV - 4	118	350	Labor	Land use for living	There are religious group in this area	Conditions were miserable most of the citizens are less capable	They all native		Loss their house
		HGV - 1	55	300	a motorcycle driver, Labor and trader	Land use for living	There are religious group in this area	Conditions were miserable most of the citizens are less capable	They all native		Loss their house
		HGV - 2	25	200	Rubber Farmer	Land use for living and plantation	There are religious group in this area	Life in this village are farmers so that the majority of the income here is uncertain	They all native		Loss their land and job
		HGV - 3	65	400	Rubber farmer and labor farmer	Land use for living and plantation	There are religious group in this area	Conditions were miserable most of the citizens are less capable the income is uncertain	They all native		Loss their house
		SRV - 5	30	150	entrepreneur, labor, public servant	Land use for living	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	They have permanent house	Many newcomers		Loss their house
		IOV - 4	600	2500	Rubber farmer and labor farmer, public servant, etc	Land use for living	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	5% are newcomers		Loss their house and business place
		IOV - 10	400	200	The Majority are farmers and half public servant	Land use for living and plantation	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	5% are newcomers		Loss their house and plantation
		SRV - 4	42	275	Traders	Land use for living	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	they have income Rp. 1.000.000 every month	they all native		Loss their house and business place
Lembak - Karangendah	Kel. Pasar I	SRV - 8	40	150	Traders	Land use for living	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	they all native		Loss their house and business place
		SRV - 7	57	210	Rubber farmer and labor farmer, public servant, etc	Land use for living	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	they all native		Loss their house and business place
		IOV - 8	1100	3500	Farmer and Labor	Land use for living	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	they all native		Loss their house and business place
		IOV - 9	70	210	Rubber Farmer	Land use for living and plantation	There are religious group in this area	Life in this village are farmers so that the majority of the income here is uncertain	They all native		Loss their land and job
		SRV - 9	1500	3500	Army and Farmer	Land use for living and plantation	There are religious group in this area	Life in this village are farmers so that the majority of the income here is uncertain	They all native		Loss their land and job
		SRV - 10	69	230	farmer	Land use for Plantation	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-		Loss Their house
		IOV - 3	70	280	Farmer and Labpr	Land use for Plantation	Social relations is quite good, there are some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-		only half of community

Section	Location	Survey Village	Number Of Houses	Village Population	Main Occupations	Land Use Situation	Social Infra Situation	Living Conditions	Indigenous People	Existence Heritages	Project Impacts	
Karang endah - Gelumbang	Sigam I	IOV - 6	45	150	Farmer and Labpr	Land use for Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-	-	only half of community	
		HGV - 10	45	150	farmer	Land use for Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-	-	Loss Their house	
	Karagendah Utara	HGV - 5	60	210	Farmer, trader vegetables	Land use for Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-	-	Loss Their house	
		Gelumbang R2 Langk 2	HGV - 6	10	50	Public, servant and farmer	Land use for living and Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-	-	Loss Their house
	Gelumbang - Seidang	Gelumbang Langk 3	SRV - 6	20	60	Trader and rubber farmer	Land use for living and Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-	-	Loss Their house
			HGV - 9	40	125	Farmer and Labpr	Land use for Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-	-	Loss Their house
Seidang - Payakabung	Talang taling	IOV - 5	1309	3927	Farmer, labor, trader	Land use for living and Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-	-	Loss Their house	
		IOV - 7	670	2000	Farmer and Labpr	Land use for Plantation	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Life in this village are farmers so that the majority of the income here is uncertain	-	-	Loss Their house	
	Payakabung - Simpang	Sei Rambutan	IOV - 2	36	120	Farmer and Labor	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	they all native	-	Loss their house and business place
			IOV - 1	48	160	entrepreneur, farmer, labor, public servant, etc	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	they all native	-	Loss their house and business place
	Kertapati	Kemang Agung	SRV - 3	4940	16000	entrepreneur, farmer, labor, public servant, etc	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	they all native	-	Loss their house and business place
			SRV - 2	4032	12000	entrepreneur, farmer, labor, public servant, etc	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	they all native	-	Loss their house and business place
Area ABCD	Kertapati Kelurahan	SRV-1	2472	9888	entrepreneur, farmer, labor, public servant, etc	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	they all native	-	Loss their house and business place	
		SRV-1	82	328	entrepreneur, farmer, labor, public servant, etc	Land use for living	Social relations is quite good, there some social groups such as PKK, Karang Taruna and religious groups	Conditions were miserable most of the citizens are less capable the income is uncertain	they all native	-	Loss their house and business place	

INVENTORY 2: INVENTORY OF HOUSEHOLDS SURVEY IN PROJECT AREA

Section	Location	Surveyed Houses	Occupation	Family Members	Years of Living	Purchase or Occupation	Land Area (m2)	House Situation	Revenue Conditions	Living Conditions	Project Impacts
Sukacinta - Banjarsari	1 Muara Mau Village	Mr.Muhamat	Rp. 2000.000	9 person's	30 years	Purchase	48	Wooden House	Rubber Farmers	Simple Life	Displaced
	2 Muara Mau Village	Mr.Sutomo	Rp. 1500.000	4 person's	21 years	Purchase	150	Concrete House	Business	Simple Life	Displaced
	3 Arahan Village	Mr.Muhama Z	Rp. 2000.000	6 person's	42 years	Occupation	400	Wooden House	Rubber Farmers	Poor Life	Displaced
	4 Ulak Pandan Village	Mr.Asran	Rp 2.000.000	6 person's	32 years	Occupation	420	Wooden House	Workshop	Simple Life	Displaced
	5 Ulak Pandan Village	Mr.Abdul Somad	Rp 2,000,000	9 person's	33 years	Occupation	30	Concrete House	Rubber Farmers	Poor Life	Displaced
	6 Muara Lawai Village	Mrs.Holimah	Rp 2,000,000	-	22 years	Occupation	1000	Wooden House	Farmers	Poor Life	Displaced
	7 Merapi Village	Mr.Bustari	Rp 2,000,000	6 person's	27 years	Occupation	320	Concrete House	Farmers	Poor Life	Displaced
	8 Merapi Village	Mr.Bustari	Rp 3,000,000	7 person's	18 years	Occupation	600	Concrete House	Farmers	Simple Life	Displaced
	9 Arahan Village	Mr.Yuslan	Rp 3,000,000	6 person's	21 years	Occupation	500	Wooden House	Farmers	Simple Life	Displaced
	10 Arahan Village	Mr.Sunari	Not Sure	5 person's	22 years	Occupation	400	Concrete House	Not Sure	Poor Life	Displaced
	11 Arahan Village	Mr.Gia	Not Sure	3 person's	17 years	Occupation	300	Wooden House	Not Sure	Poor Life	Displaced
	12 Merapi Village	Mr.Budi	Rp 3,000,000	4 person's	22 years	Occupation	450	Concrete House	Farmers	Simple Life	Displaced
	13 Merapi Village	Mr.Okta	Rp 2,500,000	5 person's	32 years	Purchase	150	Concrete House	Farmers	Simple Life	Displaced
	14 Kebur Village	PT.BAU	Rp 2,000,000	-	5 years	Purchase	10000	Concrete House	Workers PT BAU	Simple Life	Displaced
	15 Banjarsari Village	Mr.Erwan	Rp 3,000,000	6 person's	22 years	Occupation	3000	Rubber Gardener	Rubber Farmers	Simple Life	Displaced
	16 Banjarsari Village	Mr.Agus Susanto	Not Sure	5 person's	25 years	Occupation	300	Wooden House	Farmers	Poor Life	Displaced
	17 Sukacinta Village	Mr.Maryoha	Rp 2,000,000	4 person's	27 years	Occupation	70	Semi Permanent	Farmers	Poor Life	Displaced
	18 Sukacinta Village	Mrs.Rodia	Rp 2,500,000	6 person's	29 years	Occupation	48	Concrete House	Farmers	Simple Life	Displaced
Banjarsari - Muaraenim	1 Tanjung Baru Village	Mr. Marzuki	Rp 2,000,000	6 person's	31 years	Purchase	375	Concrete House	Farmers	Simple Life	Displaced
	2 Sira Pulau Village	Mr. Edy	Rp 1,500,000	3 person's	37 years	Purchase	1200	Concrete House	Labor	Simple Life	Displaced
	3 Sira Pulau Village	Mr. Marwah	Rp 2,000,000	4 person's	32 years	Occupation	1800	Concrete House	Farmers	Simple Life	Displaced
	4 Sira Pulau Village	Mr. Mat Salani	Rp 1,500,000	5 person's	52 years	Occupation	800	Concrete House	Farmers	Poor Life	Displaced
	5 Tungkal Village	Mr. Suwito	Rp 2,000,000	4 person's	19 years	Purchase	80	Permanent	Private	Simple Life	Displaced
	6 Tungkal Village	Mr. Jamudin	Rp 3,000,000	9 person's	32 years	Occupation	150	Wooden House	Trade	Simple Life	Displaced
	7 Tungkal Village	Mr. Sucipto	Not Sure	5 person's	12 years	Purchase	200	Permanent	Business	Simple Life	Displaced
	8 Tungkal Village	Mr. M. Sani	Rp 3,000,000	16 person's	32 years	Occupation	400	Concrete House	Civil Servants	Simple Life	Displaced
	9 Gunung Kembang Village	Mr. Imron	Rp 2,000,000	2 person's	33 years	Occupation	340	Concrete House	Trade	Simple Life	Displaced
	10 Gunung Kembang Village	Mr. Siha Budi	Rp 2,500,000	3 person's	15 years	Occupation	300	Concrete House	Trade	Simple Life	Displaced
	11 Muaraenim Village	Mr. Munawar Hasbi	Not Sure	7 person's	15 years	Occupation	60	Permanent	Trade	Simple Life	Displaced
	12 Merinem Village	Mr. Sirol Ani	Not Sure	6 person's	16 years	Occupation	150	Wooden House	Private	Simple Life	Displaced
	13 Muaraenim Village	Mrs Agustina	Not Sure	2 person's	15 years	Occupation	60	Permanent	Trade	Simple Life	Displaced
	14 Muaraenim Village	Mr. Cik Din Siani	Rp 1,500,000	4 person's	20 years	Purchase	66	Permanent	Pension	Simple Life	Displaced
	15 Muaraenim Village	Mr. Pendra Jaya Saputra	Rp 3,000,000	3 person's	29 years	Purchase	80	Semi Permanent	Private	Simple Life	Displaced
	16 Prabu Menang Village	Mr. Saini	Rp 2,000,000	5 person's	22 years	Occupation	200	Concrete House	Farmers	Simple Life	Displaced
	17 Prabu Menang Village	Mr. Suhardi	Rp 2,000,000	5 person's	22 years	Occupation	150	Concrete House	Farmers	Simple Life	Not Want Displaced
	18 Prabu Menang Village	Mr. Suhardan	Rp 2,000,000	3 person's	27 years	Occupation	600	Concrete House	Farmers	Simple Life	Not Want Displaced
	19 Muaraenim Village	Mr. Subehan	Not Sure	5 person's	15 years	Purchase	360	Wooden House	Labor	Simple Life	Displaced
	20 Muaraenim Village	Mr. Marjono	Rp 4,000,000	4 person's	12 years	Occupation	225	Concrete House	Pension PT.KAI	Simple Life	Displaced
	21 Tungkal Village	Mr. Wanto	Rp 1,800,000	4 person's	14 years	Occupation	70	Concrete House	Private	Simple Life	Not Want Displaced
	22 Tungkal Village	Mr. Wahyudin	Rp 2,000,000	5 person's	6 years	Purchase	50	Concrete House	Private	Simple Life	Displaced
Prabumulih - Lembak	1 Sukajadi Village	Mr.Ali Kusin	Not Sure	4 person's	12 years	Occupation	700	Semi Permanent	Labor	Poor Life	Displaced
	2 Sukajadi Village	Mr.Abdul Hakim	Rp 2,000,000	2 person's	21 years	Occupation	600	Concrete House	Pension Prabumulih	Simple Life	Displaced
	3 Pasar I Prabumulih Village	Mr. Saukani	Rp3,000,000	7 person's	12 years	Purchase	96	Concrete House	Civil Servants	Simple Life	Displaced

Section	Location	Surveyed Houses	Occupation	Family Members	Years of Living	Purchase or Occupation	Land Area (m2)	House Situation	Revenue Conditions	Living Conditions	Project Impacts	
Prabumulih - Lembak	4 Pasar I Prabumulih Village	Mr. Didi Juardi	Not Sure	7 person's	28 years	Purchase	30	Semi Permanent	Private	Simple Life	Displaced	
	5 Pasar I Prabumulih Village	Mr. Poniman	Not Sure	5 person's	22 years	Occupation	45	Semi Permanent	Labor	Poor Life	Displaced	
	6 Pasar I Prabumulih Village	Mr. Sukardi	Not Sure	6 person's	47 years	Occupation	30	Semi Permanent	Private	Simple Life	Displaced	
	7 Prabu Jaya Village	Mr. Ali Musah	Not Sure	5 person's	25 years	Occupation	225	Permanent	Labor	Poor Life	Displaced	
	8 Pasar I Prabumulih Village	Mrs. Turiyati	Rp 950,000	4 person's	39 years	Occupation	42	Concrete House	PT.KAI Widow Business	Poor Life	Displaced	
	9 Pasar I Prabumulih Village	Mr. Edi Tasman	Not Sure	3 person's	12 years	Occupation	200	Permanent	Driver	Poor Life	Displaced	
	10 Prabu Jaya Village	Mr. Hazairin	Rp 3,000,000	5 person's	16 years	Occupation	100	Concrete House	Civil Servants	Simple Life	Displaced	
	11 Cambai Village	Mr. Madrus	Not Sure	4 person's	19 years	Occupation	240	Wooden House	Singing Beggar	Poor Life	Displaced	
	12 Cambai Village	Mr. Iklan	Rp 500,000	4 person's	8 years	Occupation	60	Semi Permanent	Farmers	Poor Life	Displaced	
	13 Sukajadi Village	Mr. Ali Usman	Not Sure	2 person's	1 yeras	Occupation	300	Semi Permanent	Farmers	Poor Life	Displaced	
	14 Sukajadi Village	Mr. Sugeng Riadi	Not Sure	5 person's	39 years	Occupation	1000	Wooden House	Labor	Poor Life	Displaced	
	15 Sukajadi Village	Mr. Syahrul Riduwan	Not Sure	3 person's	4 years	Occupation	96	Permanent	Labor	Poor Life	Displaced	
	16 Sukajadi Village	Mr. Bambang Harmoko	Rp 2,100,000	6 person's	6 years	Occupation	260	Semi Permanent	Driver	Poor Life	Displaced	
	17 Sukajadi Village	Mr. Suarman	Rp 1,000,000	8 person's	10 years	Occupation	54	Concrete House	Labor	Poor Life	Displaced	
	18 Mangga Besar Village	Mr. Yayat Sudrajat	Rp 3,000,000	7 person's	32 years	Occupation	225	Permanent	Indonesia Police	Simple Life	Displaced	
	19 Mangga Besar Village	Mr. Syaipudin	Not Sure	6 person's	29 years	Occupation	225	Permanent	Trade	Poor Life	Displaced	
	20 Mangga Besar Village	Mr. Abu Mansur	Rp 3,500,000	6 person's	28 years	Occupation	900	Concrete House	Civil Servants	Simple Life	Displaced	
	21 Mangga Besar Village	Mr. Yusrianto	Rp 2,500,000	4 person's	32 years	Occupation	300	Concrete House	Civil Servants	Simple Life	Displaced	
	22 Prabu Jaya Village	Mr. Hengki	Rp 1,500,000	5 person's	22 years	Occupation	90	Concrete House	Trade	Simple Life	Displaced	
	23 Sukajadi Village	Mr. Suherman	Not Sure	3 person's	4 years	Occupation	600	Concrete House	Ojek Motorcycle	Poor Life	Displaced	
	24 Pasar I Prabumulih Village	Mr. Yanto	Rp 2,000,000	5 person's	12 years	Occupation	24	Concrete House	Labor	Poor Life	Displaced	
	25 Pasar I Prabumulih Village	Mr. Budianto	Rp 2,000,000	6 person's	40 years	Occupation	45	Semi Permanent	Trade	Simple Life	Displaced	
	26 Sukajadi Village	Mr. Maskur	Not Sure	4 person's	7 years	Purchase	300	Permanent	Private	Poor Life	Displaced	
	27 Sukajadi Village	Mr. Wahyudin	Rp 3,000,000	4 person's	54 years	Occupation	1250	Semi Permanent	Official PT.KAI	Simple Life	Displaced	
	28 Cambai Village	Mr. Raup	Rp 500,000	2 person's	4 years	Occupation	300	Semi Permanent	Farmers	Poor Life	Displaced	
	29 Pasar I Prabumulih Village	Mr. Muhamad Baki	Rp 2,500,000	4 person's	42 years	Occupation	84	Semi Permanent	Official PT.KAI	Poor Life	Displaced	
	30 Pasar I Prabumulih Village	Mr. Ripin	Rp600,000	3 person's	7 years	Occupation	112	Concrete House	Trade	Poor Life	Displaced	
	31 Sukajadi Village	Mr. Karnadi	Not Sure	3 person's	12 years	Occupation	600	Wooden House	Ice Trade	Poor Life	Displaced	
	32 Sukajadi Village	Mr. Hendra & Mr. Alwi	Not Sure	5 person's	4 years	Occupation	225	Wooden House	Farmers	Poor Life	Displaced	
	33 Cambai Village	Mr. Sardianto	Rp 500,000	4 person's	22 years	Occupation	225	Wooden House	Farmers	Poor Life	Displaced	
	Lembak - Karangendah	1 Lembak Village	Mr. Mashup	Not Sure	7 person's	18 years	Purchasing	150	Wooden House	Farmers	Poor Life	Displaced
		2 Lembak Village	Mr. Waldi	Not Sure	5 person's	32 years	Purchasing	100	Semi Permanent	Farmers	Poor Life	Displaced
		3 Karang Endah Village	Mr. Herman	Rp 2,000,000	5 person's	16 years	Purchasing	11250	Concrete House	Farmers	Simple Life	Displaced
Karangendah - Gelumbang	1 Sigam I Village	Mr. Rahman	Not Sure	3 person's	17 years	Purchasing	3400	Rubber Gardener	Rubber Farmer	Simple Life	Displaced	
	2 Sigam II Village	Mr. Marsudi	Not Sure	8 person's	21 years	Occupation	4950	Rubber Gardener	Rubber Farmer	Simple Life	Displaced	
	3 Sigam II Village	Mr. Situmorang	Not Sure	6 person's	7 years	Occupation	800	Rubber Gardener	Rubber Farmer	Simple Life	Displaced	
	4 Sigam III Village	Mr. Daing Maruji	Not Sure	4 person's	8 years	Occupation	1000	Rubber Gardener	Rubber Farmer	Simple Life	Displaced	
	5 Sigam III Village	Mr. Darmawi Lubis	Rp 6,000,000	6 person's	25 years	Occupation	200	Rubber Gardener	Pension PNS	Simple Life	Displaced	
	6 Sigam III Village	Mr. Suroso	Rp 3,000,000	5 person's	11 years	Occupation	3500	Rubber Gardener	Rubber Farmer	Simple Life	Displaced	
	7 Sigam I Village	Mr. Jhon Sophian Hadi	Not Sure	4 person's	Long Life	Occupation	600	Orange Gardener	Orange Farmer	Simple Life	Displaced	
	8 Sigam I Village	Mr. Lasiran	Not Sure	4 person's	12 years	Occupation	3000	Rubber Gardener	Rubber Farmer	Simple Life	Displaced	
Gelumbang - Serdang	1 Talang Taling Village	Mr. Bahridin	Rp 2,500,000	4 person's	19 years	Purchasing	13750	Rubber Gardener	Rubber Farmer	Simple Life	Displaced	
	2 Talang Taling Village	Mr. Mualiman	Rp 5,000,000	5 person's	17 years	Purchasing	1000	Rubber Gardener	Rubber Farmer	Simple Life	Displaced	
	3 Talang Taling Village	Mr. Imbroni	Rp 3,000,000	5 person's	12 years	Occupation	500	Wooden House	Farmers	Simple Life	Displaced	

Section	Location	Surveyed Houses	Occupation	Family Members	Years of Living	Purchase or Occupation	Land Area (m2)	House Situation	Revenue Conditions	Living Conditions	Project Impacts
Serdang - Payakabung	1 Payakabung Village	Mr. Purnomo	Rp 2,000,000	7 person's	14 years	Occupation	1500	Rubber Gardener	Rubber Farmer	Simple Life	Displaced
	2 Payakabung Village	Mr. Rahmat	Rp 1,500,000	3 person's	10 years	Occupation	1500	Rubber Gardener	Rubber Farmer	Simple Life	Displaced
	3 Payakabung Village	Mr. Jamus	Rp 2,500,000	4 person's	12 years	Occupation	4250	Rubber Gardener	Rubber Farmer	Simple Life	Displaced
Payakabung - Simpang	1 Sei Rambutan Village	Mr. Sutar	Rp 2,500,000	4 person's	36 years	Occupation	280	Wooden House	Official PT.KAI	Simple Life	Displaced
	2 Sei Rambutan Village	Mr. Turut Turoto	Rp 1,800,000	9 person's	36 years	Occupation	600	Wooden House	Pension PT.KAI	Poor Life	Displaced
Simpang - Kertapati	1 Kertapati Village	Mr. Endang Kiswanto	Rp 1,500,000	5 person's	36 years	Occupation	54	Permanent	Driver	Poor Life	Displaced
	2 Kertapati Village	Mr. Haribiyanto	Rp 1,500,000	4 person's	27 years	Occupation	36	Permanent	Workshop Labor	Poor Life	Displaced
	3 Kertapati Village	Mr. Hendra Gunawan	Rp 500,000	3 person's	5 years	Occupation	64	Wooden House	Day Laborer	Poor Life	Displaced
	4 Kertapati Village	Mr. Radjiman	Rp 2,850,000	7 person's	42 years	Occupation	200	Permanent	Pension of PT. Indonesia	Simple Life	Displaced
	5 Karya Jaya Village	Mr. Sugiono	Rp 1,500,000	4 person's	14 years	Occupation	675	Wooden House	Mining	Simple Life	Displaced
	6 Kemang Agung Village	Mrs. Khoiriyah	Rp 1,000,000	5 person's	25 years	Occupation	30	Wooden House	Trade	Poor Life	Displaced
	7 Karya Jaya Village	Mr. Rustam	Rp 600,000	4 person's	12 years	Occupation	24	Wooden House	Rubber Factory Worker	Poor Life	Displaced
	8 Kemang Agung Village	Mr. Anwar Sadat	Rp 1,500,000	4 person's	14 years	Occupation	80	Permanent	Driver	Simple Life	Displaced
	9 Karya Jaya Village	Mr. Yusuf	Rp 2,900,000	6 person's	46 years	Occupation	500	Wooden House	Pension of PT. Indonesia	Simple Life	Displaced
	10 Kemang Agung Village	Mr. Ardi	Rp 2,500,000	3 person's	25 years	Purchasing	150	Permanent	Labor Worker	Simple Life	Not Know
	11 Kemang Agung Village	Mr. Didin	Rp 1,500,000	4 person's	49 years	Occupation	150	Permanent	Labor Worker	Simple Life	Not Know
	12 Kertapati Village	Mr. Aceng	Rp 1,200,000	2 person's	47 years	Occupation	84	Permanent	Labor Worker	Poor Life	Displaced
	13 Kertapati Village	Mr. Anan Suwandi	Rp 700,000	3 person's	29 years	Occupation	50	Concrete House	Labor Worker	Poor Life	Displaced
	14 Kertapati Village	Mr. Suratmin	Rp 800,000	4 person's	32 years	Occupation	30	Wooden House	Labor Worker	Poor Life	Displaced
	15 Kertapati Village	Mr. Sadikin	Rp 3,000,000	5 person's	44 years	Occupation	72	Permanent	Official PT. KAI	Simple Life	Displaced
	16 Kertapati Village	Mr. Zainul Mustofa	Rp 3,000,000	5 person's	10 years	Occupation	36	Semi Permanent	Official PT. KAI	Simple Life	Displaced
	17 Kertapati Village	Mr. Bambang Hernowo	Rp 3,000,000	7 person's	22 years	Occupation	100	Permanent	Official PT. KAI	Simple Life	Displaced
	18 Kertapati Village	Mr. Sujiono	Rp 3,000,000	4 person's	7 years	Occupation	60	Semi Permanent	Official PT. KAI	Simple Life	Displaced
	19 Kertapati Village	Mr. Mardiyono	Rp 1,500,000	3 person's	4 years	Occupation	15	Wooden House	Building Labor	Poor Life	Displaced
	20 Kertapati Village	Mr. Andrianus	Not Sure	2 person's	4 years	Occupation	15	Wooden House	Trade	Poor Life	Displaced
	21 Kertapati Village	Mr. Najamudin	Rp 700,000	4 person's	36 years	Occupation	40	Wooden House	Day Laborer	Poor Life	Displaced
	22 Kertapati Village	Mr. Suprpto	Not Sure	6 person's	30 years	Occupation	150	Wooden House	Day Laborer	Poor Life	Displaced
	23 Kertapati Village	Mrs. Rohani	Rp 980,000	7 person's	22 years	Occupation	40	Semi Permanent	Labor Worker	Poor Life	Displaced
	24 Kemang Agung Village	Mr. Sulaiman	Rp 5,000,000	7 person's	42 years	Purchasing	80	Permanent	Pertamina Driver	Simple Life	Not Displaced
	25 Kemang Agung Village	Mr. Diman	Rp 1,000,000	3 person's	42 years	Purchasing	150	Permanent	Labor Worker	Poor Life	Not Displaced
	26 Kemang Agung Village	Mr. Sarjono	Rp 700,000	8 person's	52 years	Purchasing	300	Permanent	Pension	Simple Life	Not Displaced
	27 Kertapati Village	Mrs. Rusmawati	Rp 1,500,000	4 person's	27 years	Occupation	300	Wooden House	Housewife	Poor Life	Displaced
	28 Kertapati Village	Mr. Sugeng Heriyadi	Rp 1,200,000	5 person's	52 years	Occupation	42	Semi Permanent	Labor Building	Poor Life	Displaced
	29 Kertapati Village	Mrs. Suryati	Rp 2,000,000	5 person's	52 years	Occupation	150	Permanent	Housewife	Poor Life	Displaced
	30 Kemang Agung Village	Mr. Sugianto	Rp 1,200,000	6 person's	44 years	Occupation	100	Wooden House	Labor	Poor Life	Displaced
	31 Kemang Agung Village	Mr. Mustakim	Rp 1,200,000	6 person's	36 years	Occupation	500	Semi Permanent	Labor	Poor Life	Displaced
	32 Kemang Agung Village	Mr. Sandi Min	Rp 20,000,000	6 person's	52 years	Occupation	500	Permanent	Business	Simple Life	Not Displaced
	33 Kemang Agung Village	Mr. Sudarmanto	Rp 1,500,000	6 person's	36 years	Occupation	150	Permanent	Trade	Poor Life	Displaced
	34 Kemang Agung Village	Mr. Gunardi	Rp 3,000,000	6 person's	19 years	Occupation	120	Permanent	Business	Simple Life	Not Displaced
	35 Kemang Agung Village	Mr. Zul Haji	Rp 2,000,000	9 person's	42 years	Purchasing	500	Wooden House	Business	Simple Life	Displaced
	36 Kemang Agung Village	Mr. Sukartono	Rp 1,000,000	6 person's	42 years	Occupation	300	Permanent	Private	Simple Life	Not Displaced
	37 Kemang Agung Village	Mr. Toto Haryono	Rp 1,200,000	3 person's	22 years	Occupation	200	Wooden House	Labor	Simple Life	Not Displaced
	38 Kemang Agung Village	Mr. Dorry Hermanto	Rp 1,200,000	3 person's	32 years	Occupation	300	Semi Permanent	Private	Simple Life	Not Displaced

Terms of Reference (T.O.R.)
for
LARAP PREPARATION
(The Project for Capacity Expansion of Railway Line Lahat-Kertapati)

A. Background

As a result of the increasing coal demand from domestic power plants and other Asian countries, Indonesia's coal production has been increased each year and is likely to reach 183.30 million tons by 2020

South Sumatra has an abundant coal resource, covering more than half of the total coal deposits (18.7 billion tones) in Indonesia. Coal in South Sumatra has been used effectively. It is expected to be an important part of Indonesian's energy resource as well

The problem is that coal transportation-capacities by railway lines and trucks are presently limited. Therefore, in order to meet the increasing coal demand for domestic use and export, it is necessary to develop a double-tract railway system as for a more realistic response to a coal-chain transportation system consisting of varieties modes. Moreover, an integrated transportation system will contribute significantly to the sustainable development of the regional economy and energy in the 21st century.

PT. Kereta Api Indonesia (PT.KAI), therefore, is planning to realize the capacity expansion of the Lahat-Kertapati line (portion of red line on the below map) for coal transportation up max. 2.7 MtPA.

In order to realizing this target of transportation capacity expansion, a double tract railway system strating frpm Suca Cinta (station next to Lahat where exixitng the coal stockyard of PT.BAU) to Kertapati for loading in Kertatpati station area for exportations is considered Land acquisition and resettlement works for these works, therefore, will be carried out for a number of households presently living along the railway and in the areas of Kertapati station in the Project Area.



The social surveys for grasping the basic socio-economic situation and impacts by project implementation were carried out by PT.PESERO. However, in order to implement concrete works for land acquisition and resettlement action plan, the preparation of LARAP will be the necessary basic material for Japan Loan Proceedings.

A Consultant is entrusted to carry out this LARAP preparation.

This T.O.R. is a material notifying the conditions and the basic content of LARAP so that the Consultant can refer to this TOR for conducting the LARAP preparation works.

B. Scope of LARAP Preparation Works

The scope of preparation works is as follows:

- 1) Preparation of a plan schedule for LARAP preparation.
- 2) Collection of sufficient related data and information for envisaging impacts in each section and area by project implementation

- 3) Listing up the details about affected households and properties in each railway section and subjected areas in the Project Area for preparing the LARAP
- 4) Collection and analysis of data of the Final Report of Social Survey
- 5) Studies on basic legal frameworks for resettlement and compensation.
- 6) Studies on the plan and proceedings for executing the plan of LARAP including Grievance Responding Organization
- 7) Studies on Compensation Budget Allocation and Payment Procedure
- 8) Studies on the Compensation Cost Calculation and Negotiation Proceedings
- 9) Preparation of the LARAP including the Resettlement and Assistance Plans.
- 10) Organization of Stakeholders Meetings in affected areas in collaboration with PT KAI
- 11) Evaluation of results obtained from Stakeholders Meetings
- 12) Preparation of the Schedules for Resettlement and Related Programs
- 13) Preparation of the Monitoring and Evaluation Organization for Resettlement Proceedings
- 14) Preparation of Draft Report of LARAP and making local public consent to the content of LARAP
- 15) Submission of the Final Report of LARAP

C. Preparation Methodology and Preparation Assignments

For preparing this LARAP, the Consultant has to make a close collaboration with the Organization for Project Implementation and the JICA Team.

The working flow for conducting LARAP preparation is as follows:

- 1) Elaboration of the T.O.R
- 2) Making Reconnaissance Field Surveys of the Project Area
- 3) Studies of Results from Previous Social Surveys
- 4) Studies on Legal and Regulations for Resettlement Proceedings
- 5) Interviews of Concerned Officials on Resettlement Matters
- 6) Studies on Previous Resettlement Proceedings by PT.KAI
- 7) Collection of Compensation Costs
- 8) List up and Calculation of Compensation Costs
- 9) Plan for Budget Allocation
- 10) Plans for Related Programs
- 11) Drafting the LARAP
- 12) Organizing Stakeholder Meeting and Making Local Public Consent to the Content of

Draft Reports.

- 13) Discussions on the Draft Report of LARAP
- 14) Correction and Compilation of the Final Report of LARAP
- 15) Submission of the Final Report of LARAP

In order to carry out these works orderly and successfully, apart from the drafting of LARAP. There are three (3) major tasks to be completed basically as follows:

Task 1 will be dealt with Field Surveys for identification of affected households in each section of the Project Area, Studies of Results from Previous Social Surveys, Studies on Legal and Regulations for Resettlement Proceedings, Interviews of Concerned Officials on Resettlement Matters, Studies on Previous Resettlement Proceedings by PT.KAI and Studies on Related Compensation Costs.

Task 2 will be dealt with Listing up all affected subjects with details and Calculation of Compensation Costs, Plan for Budget Allocation and Making Plans for Related Programs.

Task 3 will be dealt with Organizing Stakeholder Meetings in collaboration with the Organization for project implementation and Plans for relocation proceedings as well as all related resettlement programs

D. Stakeholders Meetings

It will invite concerned participants from households and local organizations in the Project Area to participate in this stakeholders meeting. In principle, PT KAI will inform local government officials for making announcement to local people for participating in these stakeholders meetings. Local Consultant will prepare necessary materials for conducting fruitfully these meetings with the collaboration of Organization for Project Implementation.

In these stakeholder meetings, it will explain to stakeholders to get their understanding on the Project implementation. Opinions from indigenous groups as well as underprivileged groups such as elderly people, women, children etc. will be carefully remarked. Meanwhile, the inquiries about measures for relocation assistances and resettlement compensations will be responded by PT.KAI and JICA Team. This is also a proceeding to make local public consent to the content of the Draft Report of LARAP.

The report on proceedings and results of this stakeholder meetings will be prepared in collaboration with the Study Team.

E. Evaluation of Results from Stakeholders Meetings

After completing the related survey works and the stakeholders meeting, it will gather all obtained results for performing the evaluation works in order to prepare the Report.

As for results from the stakeholders meeting, it will collect and examine the important opinions and matters obtained from participants in these meetings in order to reflex their voices in LARAP. The minutes concerning proceedings and results of this stakeholders meeting will be made as attached materials.

F. Drafting and Discussions on LARAP

Based on the results of related studies and data collections, the drafting of LARAP will be carried out by items.. In principle, the report of LARAP and the annexed documents will be prepared respectively.

The content of LARAP (Land Acquisition Resettlement Action Plan) is basically proposed as follows:

- 1. Background**
- 2. Description of The Project and Project Area**
- 3. Resettlement Scope and Potential Impacts Identification**
- 4. Objectives of Resettlement Action Plan**
- 5. Findings from Social Surveys**
- 6. Legal Frameworks on Resettlement Matters**
- 7. Institutional Framework and Organization for Resettlement Execution**
- 8. Eligibility and Related Matters**
- 9. Valuation of Related Costs for Compensation**
- 10. Calculation for Compensation Costs for Resettlement**
- 11. Programs for Income Generation, Infrastructures and Social Activities**
- 12. Budget Allocation Programs**
- 13. Execution for Compensation Payment**
- 14. Resettlement Framework and Procedure**

- 15. Plan for Site Selection, Preparation and Relocation
- 16. Plan for Environmental Protection and Management
- 17. Plan for Community Participation
- 18. Organization for Grievance Procedure
- 19. Implementation Schedule of LARAP
- 20. Monitoring and Evaluation

G. LARAP Preparation Schedule

Based on the subject-items, the period required for LARAP preparation will be about 3 months as follows:

No	Items	1st Month	2 nd - 3 rd Months
1.	Elaboration of the T.O.R		
2.	Studies on Previous Social Surveys		
3.	Making Reconnaissance Field Surveys		
4.	Studies on Related Legal and Institutional Frameworks for Resettlement Proceedings		
5.	Studies on Previous Plans for Resettlement Proceedings		
6.	Plan for LARAP Preparation		
7.	Interviews Officials for Data Collection		
8.	Collection of Related Data and Materials		
9.	Listing up Affected Items by Section with Details		
10.	Drafting LARAP		
11.	Calculation of Compensation Costs		
12.	Drafting for Related Plans		
13.	Organizing Stakeholders Meetings and Making Local Public Consent to the Content		
14.	Finalizing Compensation Budget and Plan for Payment Schedule		
15.	Discussion and Correction of LARAP		
16.	Submission of the Final LARAP		