CHAPTER V

CONCLUSION

5.1 Conclusion

According to the data analysis from the observation, the conclusions of this research are explained below.

5.1.1 Total Duration

From the observation, the writer found that the total duration to finish one knock down formwork installation is 28 minutes, 52 seconds, and 16 milliseconds. For the conventional formwork, the writer found that the total duration to finish one conventional formwork installation is 1 hour, 18 minutes, 6 seconds, and 33 milliseconds.

5.1.2 Duration Differences

From the observation, the writer found that the duration to finish 1 m^2 knock down formwork installation is 4 minutes, 17 seconds and 39 milliseconds. For the conventional formwork, the writer found that the total duration to finish 1 m^2 conventional formwork installation is 15 minutes, 22 seconds and 40 milliseconds. Therefore, the duration differences between knock down formwork and conventional formwork installation is 11 minutes and 5 seconds. Accordingly, knock down formwork is 72.09 % faster than conventional formwork.

5.1.3 Normal Time

From the observation, the writer found that the normal duration to finish one knock down formwork installation is 29 minutes, 29 seconds, and 12 milliseconds. For the conventional formwork, the writer found that the normal

duration to finish one conventional formwork installation is 1 hour, 20 minutes, 3 seconds, and 13 milliseconds.

5.1.4 Time Productivity

From the observation, the writer found that the time productivity of knock down formwork installation is 7.8896 m^2 / hour. For the conventional formwork, the writer found that the time productivity of conventional formwork installation is 1.9643 m^2 / hour.

5.1.5 Materials Price and Workers Wage

From the observation, the writer found that the knock down formwork spent Rp. 534,548 for materials and Rp. 16,120 for workers wage. For the conventional formwork, the writer found that it spent Rp 130,518 for materials and Rp. 77,300 for workers wage. Each price is for 1 m^2 formwork installation. Thus, the knock down formwork costs Rp. 550,668 / m^2 and conventional formwork costs Rp. 207,818 / m^2.

5.1.6 Cost Differences

From the data analysis, the writer found that the cost differences between knock down formwork and conventional formwork is Rp. 342,850. Therefore, the conventional formwork is 62.24 % cheaper than knock down formwork.

Based on the result obtained from the observation, the writer conclude that the knock down formwork is more efficient to use for high rise building rather than conventional formwork. Despite the expensive price, the formwork can be used for multiple times (more than 30 times) so it is still cheaper if compared to conventional formwork that only can be used maximum 2 times (if the condition

is still good). In time aspects, the installation of knock down formwork is also faster than the conventional formwork. Because the making of formwork is only done once and used continuously during the project construction. Conversely, the conventional formwork is done only for one formwork and has to make another formwork for another column.

5.2 Recommendation

According to the result from the observation about cost and time study of knock down formwork and conventional formwork, there are some recommendations as consideration for the next observation, such as:

1. The observer should has the schedule of the work activities to be observed, so the observation can be done optimally.
2. The observer should explain about the weather and the material availability for each observation or the other factors which can influence the duration of works.
3. The knock down formwork data from this research might be used to compare the efficiency with another new formwork innovation for further research.

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APPENDIX 1

DURATION ANALYSIS DATA

Knock Down Formwork

Type of Column = K2

Dimension of Column = 400 x 800 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	26	50
2	*Sepatu Kolom* Installation	3	25	70
3	Formwork Panel Installation	1	53	24
4	Clamp	4	23	47
5	Verticality Checking	4	10	81
6	Support Installation	10	16	42
	TOTAL	**25**	**36**	**14**

Type of Column = K2

Dimension of Column = 400 x 800 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	21	20
2	*Sepatu Kolom* Installation	2	30	23
3	Formwork Panel Installation	2	35	67
4	Clamp	5	50	81
5	Verticality Checking	3	35	34
6	Support Installation	13	43	0
	TOTAL	**29**	**36**	**25**

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Type of Column = K2
Dimension of Column = 400 x 800 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	40	0
2	*Sepatu Kolom* Installation	2	39	21
3	Formwork Panel Installation	2	8	71
4	Clamp	4	19	62
5	Verticality Checking	4	31	30
6	Support Installation	13	9	35
	TOTAL	**28**	**28**	**19**

Type of Column = K2
Dimension of Column = 400 x 800 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	38	50
2	*Sepatu Kolom* Installation	2	54	88
3	Formwork Panel Installation	6	50	9
4	Clamp	5	31	48
5	Verticality Checking	3	45	70
6	Support Installation	12	59	35
	TOTAL	**33**	**40**	**0**

Type of Column = K5
Dimension of Column = 600 x 600 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	29	69
2	*Sepatu Kolom* Installation	2	26	90
3	Formwork Panel Installation	1	33	12
4	Clamp	3	42	28
5	Verticality Checking	3	22	76
6	Support Installation	12	31	80
	TOTAL	**25**	**6**	**55**

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Type of Column = K2

Dimension of Column = 400 x 800 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	27	39
2	*Sepatu Kolom* Installation	3	18	82
3	Formwork Panel Installation	2	22	69
4	Clamp	4	46	12
5	Verticality Checking	3	15	35
6	Support Installation	13	42	59
	TOTAL	**28**	**52**	**96**

Type of Column = K2

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	14	24
2	*Sepatu Kolom* Installation	4	28	56
3	Formwork Panel Installation	2	44	26
4	Clamp	3	50	74
5	Verticality Checking	3	56	92
6	Support Installation	17	10	45
	TOTAL	**33**	**25**	**17**

Type of Column = K1

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column		50	35
2	*Sepatu Kolom* Installation	4	3	39
3	Formwork Panel Installation	1	35	41
4	Clamp	4	30	4
5	Verticality Checking	3	12	51
6	Support Installation	14	55	10
	TOTAL	**27**	**6**	**80**

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Type of Column = K1

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	45	58
2	*Sepatu Kolom* Installation	3	15	0
3	Formwork Panel Installation	1	36	93
4	Clamp	4	3	57
5	Verticality Checking	3	17	39
6	Support Installation	15	44	52
	TOTAL	**29**	**42**	**99**

Type of Column = K2

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	9	96
2	*Sepatu Kolom* Installation	3	34	26
3	Formwork Panel Installation	2	9	69
4	Clamp	4	29	2
5	Verticality Checking	3	38	47
6	Support Installation	13	35	21
	TOTAL	**28**	**36**	**61**

Type of Column = K3

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	10	8
2	*Sepatu Kolom* Installation	3	55	39
3	Formwork Panel Installation	1	49	51
4	Clamp	4	30	39
5	Verticality Checking	2	56	88
6	Support Installation	15	10	14
	TOTAL	**29**	**32**	**39**

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Type of Column = K3

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	28	73
2	*Sepatu Kolom* Installation	3	55	52
3	Formwork Panel Installation	2	5	10
4	Clamp	2	4	60
5	Verticality Checking	3	42	81
6	Support Installation	13	25	40
	TOTAL	**26**	**42**	**16**

Type of Column = K2

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	3	98
2	*Sepatu Kolom* Installation	2	51	40
3	Formwork Panel Installation	2	19	33
4	Clamp	3	32	97
5	Verticality Checking	3	42	84
6	Support Installation	16	29	7
	TOTAL	**29**	**59**	**59**

Type of Column = K2

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	0	46
2	*Sepatu Kolom* Installation	2	26	81
3	Formwork Panel Installation	2	4	24
4	Clamp	4	24	57
5	Verticality Checking	3	33	2
6	Support Installation	15	30	76
	TOTAL	**28**	**59**	**86**

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Type of Column = K1

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	32	23
2	*Sepatu Kolom* Installation	2	29	53
3	Formwork Panel Installation	2	36	75
4	Clamp	3	45	91
5	Verticality Checking	2	25	39
6	Support Installation	13	34	42
	TOTAL	**26**	**24**	**23**

Type of Column = K2

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	41	13
2	*Sepatu Kolom* Installation	2	32	56
3	Formwork Panel Installation	3	36	43
4	Clamp	4	0	86
5	Verticality Checking	3	29	9
6	Support Installation	16	56	33
	TOTAL	**32**	**16**	**40**

Type of Column = K2

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	48	72
2	*Sepatu Kolom* Installation	3	0	65
3	Formwork Panel Installation	1	15	46
4	Clamp	4	18	42
5	Verticality Checking	3	7	98
6	Support Installation	11	51	37
	TOTAL	**25**	**22**	**60**

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Type of Column = K1
Dimension of Column = 400 x 700 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	42	3
2	*Sepatu Kolom* Installation	2	51	40
3	Formwork Panel Installation	3	5	84
4	Clamp	5	31	62
5	Verticality Checking	4	26	15
6	Support Installation	12	44	81
	TOTAL	**30**	**41**	**85**

Type of Column = K1
Dimension of Column = 400 x 700 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	15	35
2	*Sepatu Kolom* Installation	3	18	42
3	Formwork Panel Installation	3	16	51
4	Clamp	4	38	24
5	Verticality Checking	2	2	60
6	Support Installation	12	18	70
	TOTAL	**26**	**49**	**82**

Type of Column = K2
Dimension of Column = 400 x 700 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	16	2
2	*Sepatu Kolom* Installation	1	48	76
3	Formwork Panel Installation	2	40	18
4	Clamp	4	2	96
5	Verticality Checking	3	30	44
6	Support Installation	15	58	70
	TOTAL	**29**	**17**	**6**

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Type of Column = K2
Dimension of Column = 400 x 700 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	20	16
2	*Sepatu Kolom* Installation	3	11	50
3	Formwork Panel Installation	2	49	7
4	Clamp	4	37	76
5	Verticality Checking	4	12	19
6	Support Installation	14	29	43
	TOTAL	**30**	**40**	**11**

Type of Column = K2
Dimension of Column = 400 x 700 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column		56	46
2	*Sepatu Kolom* Installation	2	41	93
3	Formwork Panel Installation	2	38	48
4	Clamp	3	52	12
5	Verticality Checking	3	54	35
6	Support Installation	16	0	2
	TOTAL	**30**	**3**	**36**

Type of Column = K2
Dimension of Column = 400 x 700 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	6	96
2	*Sepatu Kolom* Installation	2	27	67
3	Formwork Panel Installation	2	26	19
4	Clamp	4	51	48
5	Verticality Checking	3	30	14
6	Support Installation	13	43	50
	TOTAL	**28**	**5**	**94**

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Type of Column = K1

Dimension of Column = 400 x 700 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	58	92
2	*Sepatu Kolom* Installation	2	23	39
3	Formwork Panel Installation	4	1	67
4	Clamp	4	31	88
5	Verticality Checking	2	43	36
6	Support Installation	15	33	9
	TOTAL	**31**	**12**	**31**

Type of Column = K5

Dimension of Column = 400 x 600 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration		
		M	S	MS
1	Marking Column	1	4	46
2	*Sepatu Kolom* Installation	2	15	68
3	Formwork Panel Installation	2	44	79
4	Clamp	3	4	95
5	Verticality Checking	2	2	41
6	Support Installation	12	15	17
	TOTAL	**23**	**27**	**46**

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Conventional Formwork

Type of Column = K2

Dimension of Column = 400 x 400 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		5	14	82
2	*Sepatu Kolom* Installation		6	46	19
3	Plywood and Timber Cutting		21	50	41
4	Formwork Panel Installation		27	12	61
5	Support Installation		15	37	29
6	Verticality Checking		4	55	10
	TOTAL	**1**	**21**	**36**	**42**

Type of Column = K2

Dimension of Column = 400 x 400 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		5	28	51
2	*Sepatu Kolom* Installation		5	35	22
3	Plywood and Timber Cutting		19	55	47
4	Formwork Panel Installation		25	34	18
5	Support Installation		14	0	39
6	Verticality Checking		4	17	33
	TOTAL	**1**	**14**	**51**	**10**

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Type of Column = K2
Dimension of Column = 400 x 400 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		4	31	67
2	*Sepatu Kolom* Installation		6	5	10
3	Plywood and Timber Cutting		21	47	23
4	Formwork Panel Installation		24	39	53
5	Support Installation		14	20	41
6	Verticality Checking		5	7	24
	TOTAL	**1**	**16**	**31**	**18**

Type of Column = K2
Dimension of Column = 400 x 400 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		5	10	19
2	*Sepatu Kolom* Installation		7	59	44
3	Plywood and Timber Cutting		20	38	61
4	Formwork Panel Installation		26	55	90
5	Support Installation		15	24	4
6	Verticality Checking		4	10	85
	TOTAL	**1**	**20**	**19**	**3**

Type of Column = K1
Dimension of Column = 400 x 500 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		3	27	56
2	*Sepatu Kolom* Installation		7	36	12
3	Plywood and Timber Cutting		19	24	72
4	Formwork Panel Installation		25	46	38
5	Support Installation		13	17	53
6	Verticality Checking		3	20	44
	TOTAL	**1**	**12**	**52**	**75**

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Type of Column = K1
Dimension of Column = 400 x 500 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		3	58	36
2	*Sepatu Kolom* Installation		8	2	49
3	Plywood and Timber Cutting		20	26	73
4	Formwork Panel Installation		24	41	68
5	Support Installation		10	49	84
6	Verticality Checking		3	50	37
	TOTAL	**1**	**11**	**49**	**47**

Type of Column = K1
Dimension of Column = 400 x 500 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		4	21	60
2	*Sepatu Kolom* Installation		8	20	92
3	Plywood and Timber Cutting		22	40	60
4	Formwork Panel Installation		26	25	36
5	Support Installation		13	45	86
6	Verticality Checking		3	55	41
	TOTAL	**1**	**19**	**29**	**75**

Type of Column = K1
Dimension of Column = 400 x 500 mm
Height of Column = 3000 mm
Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		5	9	78
2	*Sepatu Kolom* Installation		7	52	69
3	Plywood and Timber Cutting		21	37	26
4	Formwork Panel Installation		27	16	72
5	Support Installation		15	3	85
6	Verticality Checking		3	27	33
	TOTAL	**1**	**20**	**27**	**63**

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Type of Column = K1

Dimension of Column = 400 x 500 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		5	42	16
2	*Sepatu Kolom* Installation		8	31	48
3	Plywood and Timber Cutting		24	35	67
4	Formwork Panel Installation		26	53	66
5	Support Installation		14	27	35
6	Verticality Checking		3	4	24
	TOTAL	**1**	**23**	**14**	**56**

Type of Column = K2

Dimension of Column = 400 x 400 mm

Height of Column = 3000 mm

Amount of Workers = 2

No.	Work items	Duration			
		H	M	S	MS
1	Marking Column		4	55	23
2	*Sepatu Kolom* Installation		7	50	61
3	Plywood and Timber Cutting		24	41	75
4	Formwork Panel Installation		25	10	17
5	Support Installation		13	36	50
6	Verticality Checking		3	35	44
	TOTAL	**1**	**19**	**49**	**70**

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APPENDIX 2

RATING PERFORMANCE ANALYSIS DATA

Knock Down Formwork

Date = 4 March 2017
Time = 09.00 – 14.00
Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	26	50	3	25	70	1	53	24	4	23	47	4	10	81	10	16	42	25	36	14
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0			0.03			0.11			0.00			-0.1			0.08					
Effort	0			-0.04			0.1			0			0			0.1					
Condition	0			-0.03			0.06			-0.03			-0.03			0					
Consistency	0			-0.03			0.04			0			-0.04			0.04					
Algebraic Sum	0			-0.07			0.31			-0.03			-0.17			0.22					
Performance Factor	1			0.93			1.31			0.97			0.83			1.22					
Normal Time	1	26	50	3	11	30	2	28	34	4	15	57	3	28	17	12	32	3	27	21	91

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	21	20	2	30	23	2	35	67	5	50	81	3	35	34	13	43	0	29	36	25
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0			0.06			0.00			-0.10			0			0.06					
Effort	0			0.05			0			-0.04			0			0.02					
Condition	0			0.02			0			0			-0.03			0.02					
Consistency	0			0.03			0			-0.04			0			0					
Algebraic Sum	0			0.16			0			-0.18			-0.03			0.1					
Performance Factor	1.00			1.16			1.00			0.82			0.97			1.10					
Normal Time	1	21	20	2	54	26	2	35	67	4	47	66	3	28	88	15	5	3	30	11	70

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	40	0	2	39	21	2	8	71	4	19	62	4	31	30	13	9	35	28	28	19
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	-0.05			0.06			0.06			0.00			-0.1			0.06					
Effort	0			0.05			0.08			0			-0.08			0.02					
Condition	-0.03			0.02			0.02			0			0			0.04					
Consistency	-0.02			0.01			0.03			0			-0.04			0.04					
Algebraic Sum	-0.1			0.14			0.19			0			-0.22			0.16					
Performance Factor	0.90			1.14			1.19			1.00			0.78			1.16					
Normal Time	1	30	0	3	1	49	2	33	16	4	19	62	3	31	61	15	15	64	30	11	52

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	38	50	2	54	88	6	50	9	5	31	48	3	45	70	12	59	35	33	40	0
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	-0.05			0			-0.10			-0.05			-0.1			0.06					
Effort	0.02			0			-0.04			-0.04			0			0.08					
Condition	0			0			-0.07			0			-0.03			-0.03					
Consistency	-0.02			0			-0.04			-0.04			-0.02			0.04					
Algebraic Sum	-0.05			0			-0.25			-0.13			-0.15			0.15					
Performance Factor	0.95			1.00			0.75			0.87			0.85			1.15					
Normal Time	1	33	57	2	54	88	5	7	56	4	48	38	3	11	84	14	56	25	32	32	48

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Type of Column = K5

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	29	69	2	26	90	1	33	12	3	42	28	3	22	76	12	31	80	25	6	55
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0			0.08			0.11			0.11			0			0.06					
Effort	0			0.05			0.1			0.08			0			0.05					
Condition	0			0.02			0.04			0.04			0			0.02					
Consistency	0			0.04			0.04			0.04			0			0.04					
Algebraic Sum	0			0.19			0.29			0.27			0			0.17					
Performance Factor	1.00			1.19			1.29			1.27			1.00			1.17					
Normal Time	1	29	69	2	59	21	2	0	12	4	42	29	3	22	76	14	39	60	29	13	67

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	27	39	3	18	82	2	22	69	4	46	12	3	15	35	13	42	59	28	52	96
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0			-0.05			0.03			0.00			0			0					
Effort	0			0			0.02			-0.04			0.02			0.02					
Condition	0			0			0			0			0			0					
Consistency	0			-0.02			0.01			-0.04			0.01			0.01					
Algebraic Sum	0			-0.07			0.06			-0.08			0.03			0.03					
Performance Factor	1.00			0.93			1.06			0.92			1.03			1.03					
Normal Time	1	27	39	3	4	90	2	31	25	4	23	23	3	21	21	14	7	26	28	55	24

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Date = 11 March 2017

Time = 09.00 – 12.30

Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	14	24	4	28	56	2	44	26	3	50	74	3	56	92	17	10	45	33	25	17
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0			-0.1			0.00			0.11			-0.1			0.06					
Effort	0.02			-0.08			-0.04			-0.04			0			-0.12					
Condition	0			0			0			0.02			-0.03			-0.03					
Consistency	0			-0.04			0			0.03			-0.04			-0.04					
Algebraic Sum	0.02			-0.22			-0.04			0.12			-0.17			-0.13					
Performance Factor	1.02			0.78			0.96			1.12			0.83			0.87					
Normal Time	1	15	72	3	29	47	2	37	69	4	18	42	3	16	64	14	56	49	29	54	43

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Type of Column = K1

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total		50	35	4	3	39	1	35	41	4	30	4	3	12	51	14	55	10	27	6	80
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.11			0.06			0.11			0.03			0.03			-0.05					
Effort	0.1			-0.08			0.1			-0.08			0.05			-0.08					
Condition	0.04			-0.03			0.04			0			0.02			-0.03					
Consistency	0.04			-0.04			0.04			-0.02			0.01			-0.02					
Algebraic Sum	0.29			-0.09			0.29			-0.07			0.11			-0.04					
Performance Factor	1.29			0.91			1.29			0.93			1.11			0.96					
Normal Time	1	4	95	3	41	48	2	3	7	4	11	13	3	33	68	14	19	29	28	53	60

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Type of Column = K1

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	45	58	3	15	0	1	36	93	4	3	57	3	17	39	15	44	52	29	42	99
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.03			-0.05			0.11			0.11			0			0					
Effort	-0.04			0.02			0.1			-0.04			0.02			-0.12					
Condition	-0.03			-0.03			0.04			0.02			0			0					
Consistency	-0.04			-0.02			0.04			0.01			0			-0.04					
Algebraic Sum	-0.08			-0.08			0.29			0.10			0.02			-0.16					
Performance Factor	0.92			0.92			1.29			1.10			1.02			0.84					
Normal Time	1	37	13	2	59	40	2	5	4	4	27	92	3	21	33	13	13	39	27	44	21

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	9	96	3	34	26	2	9	69	4	29	2	3	38	47	13	35	21	28	36	61
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.08			0			0.06			0.00			0			0.08					
Effort	0.1			-0.04			0.08			-0.08			-0.04			0.05					
Condition	0.04			0			0.04			0			-0.03			-0.03					
Consistency	0.01			-0.04			0.03			0			-0.02			0.03					
Algebraic Sum	0.23			-0.08			0.21			-0.08			-0.09			0.13					
Performance Factor	1.23			0.92			1.21			0.92			0.91			1.13					
Normal Time	1	26	5	3	17	11	2	36	92	4	7	49	3	18	80	15	21	64	30	8	1

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Date = 11 March 2017

Time = 15.00 – 17.00

Type of Column = K3

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	10	8	3	55	39	1	49	51	4	30	39	2	56	88	15	10	14	29	32	39
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.03			-0.05			0.06			-0.05			0.08			-0.05					
Effort	0.02			-0.04			0.05			0			0.1			-0.04					
Condition	0			-0.03			0.02			0.02			0.02			0.02					
Consistency	0.01			-0.04			0.04			-0.02			0.03			-0.04					
Algebraic Sum	0.06			-0.16			0.17			-0.05			0.23			-0.11					
Performance Factor	1.06			0.84			1.17			0.95			1.23			0.89					
Normal Time	1	14	28	3	18	72	2	8	12	4	16	87	3	37	56	13	30	2	28	5	57

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Type of Column = K3

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	28	73	3	55	52	2	5	10	2	4	60	3	42	81	13	25	40	26	42	16
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.08			0.08			0.11			0.11			0.08			0.06					
Effort	0.08			0.05			0.1			0.1			-0.04			0.02					
Condition	0.04			0.04			0.06			0.04			0			0.02					
Consistency	0			-0.04			0.03			0.04			-0.02			0.04					
Algebraic Sum	0.2			0.13			0.3			0.29			0.02			0.14					
Performance Factor	1.20			1.13			1.30			1.29			1.02			1.14					
Normal Time	1	46	47	2	46	13	2	42	63	2	40	73	4	7	26	15	18	15	29	21	37

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	3	98	2	51	40	2	19	33	3	32	97	3	42	84	16	29	7	29	59	59
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.08			0.06			0.11			0.08			0.11			0.03					
Effort	0.1			0.05			0.1			0.05			0.02			-0.12					
Condition	0.02			0.04			0.04			0.04			-0.03			-0.07					
Consistency	0.03			0			0.01			0.04			-0.02			-0.04					
Algebraic Sum	0.23			0.15			0.26			0.21			0.08			-0.2					
Performance Factor	1.23			1.15			1.26			1.21			1.08			0.80					
Normal Time	1	18	69	3	17	11	2	55	55	4	17	69	4	0	66	13	11	25	29	0	95

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Date = 17 March 2017

Time = 10.00 – 15.00

Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	0	46	2	26	81	2	4	24	4	24	57	3	33	2	15	30	76	28	59	86
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.13			0.11			0.11			0.00			0.08			0					
Effort	0.08			0.1			0.08			0.05			0.05			-0.04					
Condition	0.04			0.04			0.04			0			0.04			-0.03					
Consistency	0.03			0.04			0.04			0			0			-0.04					
Algebraic Sum	0.28			0.29			0.27			0.05			0.17			-0.11					
Performance Factor	1.28			1.29			1.27			1.05			1.17			0.89					
Normal Time	1	17	38	3	9	38	2	37	78	4	37	79	4	9	23	13	48	37	29	39	93

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Type of Column = K1

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	32	23	2	29	53	2	36	75	3	45	91	2	25	39	13	34	42	26	24	23
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.11			0.11			0.00			0.11			0.11			0.03					
Effort	0.05			0.1			0.05			0.1			0.1			0.02					
Condition	0.02			0.04			0			0.04			0.06			0.02					
Consistency	0			0.04			0			0.04			0.04			0.03					
Algebraic Sum	0.18			0.29			0.05			0.29			0.31			0.1					
Performance Factor	1.18			1.29			1.05			1.29			1.31			1.10					
Normal Time	1	48	83	3	12	89	2	44	58	4	51	42	3	10	46	14	55	86	30	44	4

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	41	13	2	32	56	3	36	43	4	0	86	3	29	9	16	56	33	32	16	40
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	-0.05			0.11			0.03			0.06			0.03			0.03					
Effort	0.02			0.08			-0.12			0.02			0.02			-0.12					
Condition	-0.03			0.04			0			0			0			0					
Consistency	-0.04			0.03			-0.04			0.01			0			-0.04					
Algebraic Sum	-0.1			0.26			-0.13			0.09			0.05			-0.13					
Performance Factor	0.90			1.26			0.87			1.09			1.05			0.87					
Normal Time	1	31	1	3	12	22	3	8	29	4	22	53	3	39	54	14	44	20	30	37	79

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	48	72	3	0	65	1	15	46	4	18	42	3	7	98	11	51	37	25	22	60
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	-0.05			0			0.11			0.00			0.06			0.11					
Effort	-0.04			0.02			0.1			0			0.05			0.1					
Condition	-0.03			0			0.04			0			0.04			0.04					
Consistency	-0.02			0			0.04			0			0.01			0.04					
Algebraic Sum	-0.14			0.02			0.29			0			0.16			0.29					
Performance Factor	0.86			1.02			1.29			1.00			1.16			1.29					
Normal Time	1	33	49	3	4	26	1	37	34	4	18	42	3	38	5	15	17	66	29	29	22

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Type of Column = K1

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	42	3	2	51	40	3	5	84	5	31	62	4	26	15	12	44	81	30	41	85
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	-0.05			0			0.00			-0.10			-0.1			0.08					
Effort	-0.08			0.02			-0.04			-0.08			-0.08			0.05					
Condition	0.02			0.02			0			0			0.02			0.04					
Consistency	-0.02			0			-0.04			-0.04			-0.04			0.04					
Algebraic Sum	-0.13			0.04			-0.08			-0.22			-0.2			0.21					
Performance Factor	0.87			1.04			0.92			0.78			0.80			1.21					
Normal Time	1	28	76	2	58	25	2	50	97	4	18	66	3	32	92	15	25	42	30	34	98

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Type of Column = K1

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	15	35	3	18	42	3	16	51	4	38	24	2	2	60	12	18	70	26	49	82
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.06			-0.05			-0.05			-0.05			0.11			0.11					
Effort	0.05			-0.04			0			0.02			0.08			0.08					
Condition	0.02			0			-0.07			-0.03			0.04			0.04					
Consistency	0			-0.02			-0.04			-0.02			0.04			0.04					
Algebraic Sum	0.13			-0.11			-0.16			-0.08			0.27			0.27					
Performance Factor	1.13			0.89			0.84			0.92			1.27			1.27					
Normal Time	1	25	14	2	56	59	2	45	6	4	15	98	2	35	70	15	38	14	29	36	61

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Date = 22 March 2017

Time = 10.00 – 12.00

Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	16	2	1	48	76	2	40	18	4	2	96	3	30	44	15	58	70	29	17	6
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0			0.11			0.00			0.03			0			0.06					
Effort	0.05			0.1			0			0.02			0			-0.08					
Condition	0.04			0.04			-0.03			0.02			0			-0.03					
Consistency	0			0.04			0			0.01			0			-0.04					
Algebraic Sum	0.09			0.29			-0.03			0.08			0			-0.09					
Performance Factor	1.09			1.29			0.97			1.08			1.00			0.91					
Normal Time	1	22	86	2	20	30	2	35	37	4	22	39	3	30	44	14	32	41	28	43	77

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	20	16	3	11	50	2	49	7	4	37	76	4	12	19	14	29	43	30	40	11
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0			-0.05			-0.10			0.00			0.06			-0.05					
Effort	0.05			0.02			-0.04			-0.04			-0.08			0.02					
Condition	0.04			0			0			0			0.02			-0.03					
Consistency	0			-0.02			0			-0.04			-0.04			-0.04					
Algebraic Sum	0.09			-0.05			-0.14			-0.08			-0.04			-0.1					
Performance Factor	1.09			0.95			0.86			0.92			0.96			0.90					
Normal Time	1	27	37	3	1	92	2	25	40	4	15	53	4	2	10	13	2	48	28	14	80

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Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total		56	46	2	41	93	2	38	48	3	52	12	3	54	35	16	0	2	30	3	36
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.11			0.06			0.00			0.08			0.06			0.06					
Effort	0.1			0.05			0			0.08			-0.08			-0.12					
Condition	0.04			0.02			0			0.02			0			-0.03					
Consistency	0.04			0.01			0			0.03			-0.04			-0.04					
Algebraic Sum	0.29			0.14			0			0.21			-0.06			-0.13					
Performance Factor	1.29			1.14			1.00			1.21			0.94			0.87					
Normal Time	1	12	83	3	4	60	2	38	48	4	40	86	3	40	28	13	55	21	29	12	26

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Date = 22 March 2017

Time = 15.00 – 17.00

Type of Column = K2

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	6	96	2	27	67	2	26	19	4	51	48	3	30	14	13	43	50	28	5	94
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.08			0.08			0.00			0.03			0			0.06					
Effort	0.08			0.1			0.02			-0.08			-0.04			0.05					
Condition	0.04			0.02			0.02			-0.03			0.02			0					
Consistency	0.01			0.04			0			-0.04			0			0.03					
Algebraic Sum	0.21			0.24			0.04			-0.12			-0.02			0.14					
Performance Factor	1.21			1.24			1.04			0.88			0.98			1.14					
Normal Time	1	21	2	3	3	11	2	32	3	4	16	50	3	25	93	15	38	79	30	17	38

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Type of Column = K1

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	58	92	2	23	39	4	1	67	4	31	88	2	43	36	15	33	9	31	12	31
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0			0.08			0.06			0.03			0.08			0.03					
Effort	-0.04			0.08			0			-0.04			0.05			0.05					
Condition	0			0.02			-0.07			0			0.02			-0.07					
Consistency	-0.04			0.04			-0.04			-0.02			0.04			-0.04					
Algebraic Sum	-0.08			0.22			-0.05			-0.03			0.19			-0.04					
Performance Factor	0.92			1.22			0.95			0.97			1.19			0.96					
Normal Time	1	49	40	2	54	93	3	49	58	4	23	72	3	14	39	14	55	76	31	7	78

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Type of Column = K5

Rating Performance Analysis of Knock Down Formwork																					
No.	Works Item																		Total Duration		
	1			2			3			4			5			6					
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS
Total	1	4	46	2	15	68	2	44	79	3	4	95	2	2	41	12	15	17	23	27	46
Mean	1	23	48	2	59	50	2	35	97	4	17	43	3	26	64	14	9	14	28	52	16
Skill	0.08			0.08			0.00			0.08			0.11			0.08					
Effort	0.05			0.08			-0.04			0.1			0.08			0.05					
Condition	0.02			0.04			-0.03			0.04			0.04			0.04					
Consistency	0.01			0.04			0			0.04			0.04			0.04					
Algebraic Sum	0.16			0.24			-0.07			0.26			0.27			0.21					
Performance Factor	1.16			1.24			0.93			1.26			1.27			1.21					
Normal Time	1	14	77	2	48	24	2	33	25	3	53	3	2	35	46	14	49	55	28	54	30

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Conventional Formwork

Date = 8 May 2017

Time = 09.00 – 12.00

Type of Column = K2

Rating Performance Analysis of Conventional Formwork																						
No.	Work Activities																		Total Duration			
	1			2			3			4			5			6						
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	H	M	S	MS
Total	5	14	82	6	46	19	21	50	41	27	12	61	15	37	29	4	55	10	1	21	36	42
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	-0.05			0.06			0			0.03			0			0						
Effort	-0.04			0.02			0			-0.04			-0.08			-0.04						
Condition	0.02			0.02			0			0			0			0						
Consistency	-0.04			0.04			0			-0.04			-0.04			-0.04						
Algebraic Sum	-0.11			0.14			0			-0.05			-0.12			-0.08						
Performance Factor	0.89			1.14			1			0.95			0.88			0.92						
Normal Time	4	40	19	7	43	6	21	50	41	25	50	98	13	44	82	4	31	49	1	18	20	95

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Type of Column = K2

Rating Performance Analysis of Conventional Formwork																						
No.	Work Activities																		Total Duration			
	1			2			3			4			5			6						
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	H	M	S	MS
Total	5	28	51	5	35	22	19	55	47	25	34	18	14	0	39	4	17	33	**1**	**14**	**51**	**10**
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	-0.05			0.06			0.06			0.03			0			0.03						
Effort	-0.04			0.05			0.02			0			0			-0.04						
Condition	0.02			0.02			0			0			0			0						
Consistency	-0.04			0.04			0.04			0.04			0			-0.02						
Algebraic Sum	-0.11			0.17			0.12			0.07			0			-0.03						
Performance Factor	0.89			1.17			1.12			1.07			1.00			0.97						
Normal Time	4	52	37	6	32	21	22	18	93	27	21	57	14	0	39	4	9	61	1	19	15	8

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Date = 9 May 2017

Time = 09.00 – 13.00

Type of Column = K2

Rating Performance Analysis of Conventional Formwork																						
No.	Work Activities																		Total Duration			
	1			2			3			4			5			6						
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	H	M	S	MS
Total	4	31	67	6	5	10	21	47	23	24	39	53	14	20	41	5	7	24	**1**	**16**	**31**	**18**
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	0			0.03			0			0.03			0			0						
Effort	0.02			0.05			0			0.05			0.02			-0.08						
Condition	0			0.02			0			0			-0.03			-0.03						
Consistency	0.01			0.04			0			0.04			-0.02			-0.04						
Algebraic Sum	0.03			0.14			0			0.12			-0.03			-0.15						
Performance Factor	1.03			1.14			1.00			1.12			0.97			0.85						
Normal Time	4	39	82	6	56	21	21	47	23	27	37	7	13	54	60	4	21	15	1	19	16	8

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Type of Column = K2

Rating Performance Analysis of Conventional Formwork																						
No.	**Work Activities**																		**Total Duration**			
	1			**2**			**3**			**4**			**5**			**6**						
	M	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**H**	**M**	**S**	**MS**
Total	5	10	19	7	59	44	20	38	61	26	55	90	15	24	4	4	10	85	**1**	**20**	**19**	**3**
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	0.03			0.03			0.03			0			0			0						
Effort	-0.08			-0.04			0.02			0			-0.08			-0.04						
Condition	0			0			0			0			0			0						
Consistency	-0.02			-0.04			0.04			-0.04			-0.04			-0.02						
Algebraic Sum	-0.07			-0.05			0.09			-0.04			-0.12			-0.06						
Performance Factor	0.93			0.95			1.09			0.96			0.88			0.94						
Normal Time	4	48	48	7	35	47	22	30	8	25	51	26	13	33	16	3	55	80	1	18	14	25

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Date = 10 May 2017

Time = 08.00 – 12.00

Type of Column = K1

Rating Performance Analysis of Conventional Formwork																						
No.	Work Activities																		Total Duration			
	1			2			3			4			5			6						
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	H	M	S	MS
Total	3	27	56	7	36	12	19	24	72	25	46	38	13	17	53	3	20	44	**1**	**12**	**52**	**75**
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	0.06			0			0.06			0.03			0.03			0						
Effort	0.02			0			0.05			0.02			0.02			0.02						
Condition	0			0			0.02			0			0			0.02						
Consistency	0.04			-0.02			0.04			0.01			0.04			0.01						
Algebraic Sum	0.12			-0.02			0.17			0.06			0.09			0.05						
Performance Factor	1.12			0.98			1.17			1.06			1.09			1.05						
Normal Time	3	52	47	7	27	0	22	42	72	27	19	16	14	29	31	3	30	46	1	19	21	12

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Type of Column = K1

Rating Performance Analysis of Conventional Formwork																						
No.	**Work Activities**																		**Total Duration**			
	1			**2**			**3**			**4**			**5**			**6**						
	M	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**H**	**M**	**S**	**MS**
Total	3	58	36	8	2	49	20	26	73	24	41	68	10	49	84	3	50	37	**1**	**11**	**49**	**47**
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	0.06			0			0.06			0.03			0.03			0						
Effort	0			0			0.02			0.05			0.02			0						
Condition	0			-0.03			0			0			0.02			0						
Consistency	0.04			-0.04			0.04			0.04			0.04			0						
Algebraic Sum	0.1			-0.07			0.12			0.12			0.11			0						
Performance Factor	1.10			0.93			1.12			1.12			1.11			1.00						
Normal Time	4	22	20	7	28	72	22	53	94	27	39	48	12	1	32	3	50	37	1	18	16	3

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Date = 11 May 2017

Time = 08.00 – 12.00

Type of Column = K1

Rating Performance Analysis of Conventional Formwork																						
No.	Work Activities																		Total Duration			
	1			2			3			4			5			6						
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	H	M	S	MS
Total	4	21	60	8	20	92	22	40	60	26	25	36	13	45	86	3	55	41	**1**	**19**	**29**	**75**
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	0			0.03			0.03			0			0.03			0						
Effort	0.02			-0.08			-0.04			0			0.02			0						
Condition	0			-0.03			0			0			0			0						
Consistency	0.01			-0.04			-0.04			-0.02			0.01			0						
Algebraic Sum	0.03			-0.12			-0.05			-0.02			0.06			0						
Performance Factor	1.03			0.88			0.95			0.98			1.06			1.00						
Normal Time	4	29	45	7	20	81	21	32	57	25	53	65	14	35	41	3	55	41	1	17	47	3

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Type of Column = K1

Rating Performance Analysis of Conventional Formwork																						
No.	**Work Activities**																		**Total Duration**			
	1			**2**			**3**			**4**			**5**			**6**						
	M	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**H**	**M**	**S**	**MS**
Total	5	9	78	7	52	69	21	37	26	27	16	72	15	3	85	3	27	33	**1**	**20**	**27**	**63**
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	0			0.03			0.00			0.00			0			0						
Effort	-0.04			0			0			0			-0.04			0.02						
Condition	0			-0.03			0			-0.03			0			0						
Consistency	-0.02			-0.02			0			-0.04			-0.04			0.03						
Algebraic Sum	-0.06			-0.02			0			-0.07			-0.08			0.05						
Performance Factor	0.94			0.98			1.00			0.93			0.92			1.05						
Normal Time	4	51	19	7	23	24	21	37	26	25	22	15	13	51	54	3	37	70	1	16	43	8

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Date = 12 May 2017

Time = 08.00 – 12.00

Type of Column = K1

Rating Performance Analysis of Conventional Formwork																						
No.	**Work Activities**																		**Total Duration**			
	1			**2**			**3**			**4**			**5**			**6**						
	M	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**M**	**S**	**MS**	**H**	**M**	**S**	**MS**
Total	5	42	16	8	31	48	24	35	67	26	53	66	14	27	35	3	4	24	**1**	**23**	**14**	**56**
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	0			0			0.00			0.00			0			0						
Effort	-0.04			-0.08			-0.08			-0.04			-0.04			0.02						
Condition	0			0			-0.03			-0.03			0			0						
Consistency	-0.04			-0.04			-0.04			-0.02			-0.02			0.03						
Algebraic Sum	-0.08			-0.12			-0.15			-0.09			-0.06			0.05						
Performance Factor	0.92			0.88			0.85			0.91			0.94			1.05						
Normal Time	5	14	79	7	30	10	20	54	32	24	28	43	13	35	31	3	13	45	1	14	56	40

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Type of Column = K2

Rating Performance Analysis of Conventional Formwork																						
No.	Work Activities																		Total Duration			
	1			2			3			4			5			6						
	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	M	S	MS	H	M	S	MS
Total	4	55	23	7	50	61	24	41	75	25	10	17	13	36	50	3	35	44	**1**	**19**	**49**	**70**
Mean	4	47	98	7	28	2	21	45	84	26	3	61	14	2	50	3	58	38	1	18	6	33
Skill	0			0			0.00			0.03			0.03			0						
Effort	0			-0.04			-0.08			0.02			0.02			0.02						
Condition	0			0			-0.03			0			0			0						
Consistency	0			-0.02			-0.04			0.04			0.01			0.03						
Algebraic Sum	0			-0.06			-0.15			0.09			0.06			0.05						
Performance Factor	1.00			0.94			0.85			1.09			1.06			1.05						
Normal Time	4	55	23	7	22	37	20	59	49	27	26	9	14	25	49	3	46	21	1	18	54	88

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APPENDIX 3

TIME PRODUCTIVITY ANALYSIS DATA

Knock Down Formwork

Time Productivity Analysis of Knock Down Formwork									
NO.	FLOOR	TYPE OF COLUMN	AREA (m^2)	TOTAL DURATION			TOTAL DURATION (hour)	TIME PRODUCTIVITY (m^2 / 2 man hour)	TIME PRODUCTIVITY (m^2 / man hours)
				M	S	MS			
1	Mezanine	K2	7.2	25	36	14	0.4267	16.8735	8.4367
2	Mezanine	K2	7.2	29	36	25	0.4934	14.5925	7.2963
3	Mezanine	K2	7.2	28	28	19	0.4745	15.1740	7.5870
4	Mezanine	K2	7.2	33	40	0	0.5611	12.8317	6.4158
5	Mezanine	K5	7.2	25	6	55	0.4185	17.2049	8.6024
6	Mezanine	K2	7.2	28	52	96	0.4814	14.9571	7.4785
7	3	K2	6.6	33	25	17	0.5570	11.8494	5.9247
8	3	K1	6.6	27	6	80	0.4519	14.6054	7.3027
9	3	K1	6.6	29	42	99	0.4953	13.3259	6.6630
10	3	K2	6.6	28	36	61	0.4768	13.8412	6.9206
11	4	K3	6.6	29	32	39	0.4923	13.4056	6.7028
12	4	K3	6.6	26	42	16	0.4450	14.8300	7.4150

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Time Productivity Analysis of Knock Down Formwork									
No.	FLOOR	TYPE OF COLUMN	AREA (m^2)	TOTAL DURATION			TOTAL DURATION (hour)	TIME PRODUCTIVITY (m^2 / 2 man hour)	TIME PRODUCTIVITY (m^2 / man hours)
				M	S	MS			
13	4	K2	6.6	29	59	59	0.4999	13.2030	6.6015
14	4	K2	6.6	28	59	86	0.4833	13.6563	6.8281
15	4	K1	6.6	26	24	23	0.4401	14.9978	7.4989
16	4	K2	6.6	32	16	40	0.5379	12.2702	6.1351
17	4	K2	6.6	25	22	60	0.4229	15.6049	7.8024
18	4	K1	6.6	30	41	85	0.5116	12.9001	6.4500
19	4	K1	6.6	26	49	82	0.4472	14.7594	7.3797
20	4	K2	6.6	29	17	6	0.4881	13.5226	6.7613
21	4	K2	6.6	30	40	11	0.5111	12.9123	6.4561
22	5	K2	6.6	30	3	36	0.5009	13.1754	6.5877
23	5	K2	6.6	28	5	94	0.4683	14.0930	7.0465
24	5	K1	6.6	31	12	31	0.5201	12.6902	6.3451
25	5	K5	6	23	27	46	0.3910	15.3468	7.6734
TOTAL							**13.4196**	**394.4801**	**197.2401**
MEAN							**0.5368**	**15.7792**	**7.8896**

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Conventional Formwork

Time Productivity Analysis of Conventional Formwork										
No.	Floor	Type of Column	Area (m^2)	TOTAL DURATION				TOTAL DURATION (hour)	TIME PRODUCTIVITY (m^2 /2 man hours)	TIME PRODUCTIVITY (m^2 / man hours)
				H	M	S	MS			
1	1	K2	4.8	1	21	36	42	1.3601	3.5291	1.7646
2	1	K2	4.8	1	14	51	10	1.2475	3.8476	1.9238
3	1	K2	4.8	1	16	31	18	1.2753	3.7637	1.8819
4	1	K2	4.8	1	20	19	3	1.3386	3.5858	1.7929
5	1	K1	5.4	1	12	52	75	1.2147	4.4457	2.2229
6	1	K1	5.4	1	11	49	47	1.1971	4.5110	2.2555
7	1	K1	5.4	1	19	29	75	1.3249	4.0757	2.0378
8	1	K1	5.4	1	20	27	63	1.3410	4.0268	2.0134
9	1	K1	5.4	1	23	14	56	1.3874	3.8922	1.9461
10	1	K2	4.8	1	19	49	70	1.3305	3.6077	1.8039
TOTAL								**13.0171**	**39.2854**	**19.6427**
MEAN								**1.3017**	**3.9285**	**1.9643**

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APPENDIX 4

WORKER COEFFICIENT ANALYSIS DATA

Knock Down Formwork

Worker Coefficient Analysis of Knock Down Formwork												
No.	Type of Column	Area (m^2)	Duration (hour)	Amount of Workers				Time Productivity (m^2 / man hour)	Worker Coefficient (OH)			
				Foreman	Vice Foreman	Chief Worker	Worker		Foreman	Vice Foreman	Chief Worker	Worker
1	K2	7.2	0.4267	1	1	1	2	8.4367	0.0085	0.0085	0.0085	0.1185
2	K2	7.2	0.4934	1	1	1	2	7.2963	0.0098	0.0098	0.0098	0.1371
3	K2	7.2	0.4745	1	1	1	2	7.5870	0.0094	0.0094	0.0094	0.1318
4	K2	7.2	0.5611	1	1	1	2	6.4158	0.0111	0.0111	0.0111	0.1559
5	K5	7.2	0.4185	1	1	1	2	8.6024	0.0083	0.0083	0.0083	0.1162
6	K2	7.2	0.4814	1	1	1	2	7.4785	0.0096	0.0096	0.0096	0.1337
7	K2	6.6	0.5570	1	1	1	2	5.9247	0.0121	0.0121	0.0121	0.1688
8	K1	6.6	0.4519	1	1	1	2	7.3027	0.0098	0.0098	0.0098	0.1369
9	K1	6.6	0.4953	1	1	1	2	6.6630	0.0107	0.0107	0.0107	0.1501
10	K2	6.6	0.4768	1	1	1	2	6.9206	0.0103	0.0103	0.0103	0.1445
11	K3	6.6	0.4923	1	1	1	2	6.7028	0.0107	0.0107	0.0107	0.1492
12	K3	6.6	0.4450	1	1	1	2	7.4150	0.0096	0.0096	0.0096	0.1349
13	K2	6.6	0.4999	1	1	1	2	6.6015	0.0108	0.0108	0.0108	0.1515
14	K2	6.6	0.4833	1	1	1	2	6.8281	0.0105	0.0105	0.0105	0.1465
15	K1	6.6	0.4401	1	1	1	2	7.4989	0.0095	0.0095	0.0095	0.1334

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Worker Coefficient Analysis of Knock Down Formwork												
No.	Type of Column	Area (m^2)	Duration (hour)	Amount of Workers				Time Productivity (m^2 / man hour)	Worker Coefficient (OH)			
				Foreman	Vice Foreman	Chief Worker	Worker		Foreman	Vice Foreman	Chief Worker	Worker
16	K2	6.6	0.5379	1	1	1	2	6.1351	0.0116	0.0116	0.0116	0.1630
17	K2	6.6	0.4229	1	1	1	2	7.8024	0.0092	0.0092	0.0092	0.1282
18	K1	6.6	0.5116	1	1	1	2	6.4500	0.0111	0.0111	0.0111	0.1550
19	K1	6.6	0.4472	1	1	1	2	7.3797	0.0097	0.0097	0.0097	0.1355
20	K2	6.6	0.4881	1	1	1	2	6.7613	0.0106	0.0106	0.0106	0.1479
21	K2	6.6	0.5111	1	1	1	2	6.4561	0.0111	0.0111	0.0111	0.1549
22	K2	6.6	0.5009	1	1	1	2	6.5877	0.0108	0.0108	0.0108	0.1518
23	K2	6.6	0.4683	1	1	1	2	7.0465	0.0101	0.0101	0.0101	0.1419
24	K1	6.6	0.5201	1	1	1	2	6.3451	0.0113	0.0113	0.0113	0.1576
25	K5	6	0.3910	1	1	1	2	7.6734	0.0093	0.0093	0.0093	0.1303
TOTAL								**176.3115**	**0.2554**	**0.2554**	**0.2554**	**3.5750**
MEAN								**7.052460882**	**0.0102**	**0.0102**	**0.0102**	**0.1430**

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Conventional Formwork

No	Type of Column	Area (m^2)	Duration (hour)	Amount of Workers				Time Productivity (m^2 / man hour)	Worker Coefficient (OH)			
				Foreman	Chief Workers	Workers	Labors		Foreman	Chief Workers	Workers	Labors
1	K2	4.8	1.3601	1	1	2	2	1.7646	0.0472	0.0472	0.2834	0.5667
2	K2	4.8	1.2475	1	1	2	2	1.9238	0.0433	0.0433	0.2599	0.5198
3	K2	4.8	1.2753	1	1	2	2	1.8819	0.0443	0.0443	0.2657	0.5314
4	K2	4.8	1.3386	1	1	2	2	1.7929	0.0465	0.0465	0.2789	0.5578
5	K1	5.4	1.2147	1	1	2	2	2.2229	0.0375	0.0375	0.2249	0.4499
6	K1	5.4	1.1971	1	1	2	2	2.2555	0.0369	0.0369	0.2217	0.4434
7	K1	5.4	1.3249	1	1	2	2	2.0378	0.0409	0.0409	0.2454	0.4907
8	K1	5.4	1.3410	1	1	2	2	2.0134	0.0414	0.0414	0.2483	0.4967
9	K1	5.4	1.3874	1	1	2	2	1.9461	0.0428	0.0428	0.2569	0.5138
10	K2	4.8	1.3305	1	1	2	2	1.8039	0.0462	0.0462	0.2772	0.5544
TOTAL								**19.6427**	**0.4270**	**0.4270**	**2.5622**	**5.1245**
MEAN								**1.9643**	**0.0427**	**0.0427**	**0.2562**	**0.5124**

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APPENDIX 5

MATERIAL COEFFICIENT ANALYSIS DATA

Knock Down Formwork

Material Coefficient Analysis of Knock Down Formwork										
No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
1	Mezannine	K2	800	400	3000	7.2	Phenolic Plywood	7.2	2.4187	0.4167
							Hollow Iron	56.64	9.44	1.3889
							Tie Rod	3.6	1.2	0.2778
							Wing Nut	12		1.6667
							Tapping Screw	48		6.6667
2	Mezannine	K2	800	400	3000	7.2	Phenolic Plywood	7.2	2.4187	0.4167
							Hollow Iron	56.64	9.44	1.3889
							Tie Rod	3.6	1.2	0.2778
							Wing Nut	12		1.6667
							Tapping Screw	48		6.6667

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Material Coefficient Analysis of Knock Down Formwork										
No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
3	Mezannine	K2	800	400	3000	7.2	Phenolic Plywood	7.2	2.4187	0.4167
							Hollow Iron	56.64	9.44	1.3889
							Tie Rod	3.6	1.2	0.2778
							Wing Nut	12		1.6667
							Tapping Screw	48		6.6667
4	Mezannine	K2	800	400	3000	7.2	Phenolic Plywood	7.2	2.4187	0.4167
							Hollow Iron	56.64	9.44	1.3889
							Tie Rod	3.6	1.2	0.2778
							Wing Nut	12		1.6667
							Tapping Screw	48		6.6667

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Material Coefficient Analysis of Knock Down Formwork										
No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
5	Mezannine	K5	600	600	3000	7.2	Phenolic Plywood	7.2	2.4187	0.4167
							Hollow Iron	53.84	8.9733	1.3
							Tie Rod	3.6	1.2	0.2778
							Wing Nut	12		1.6667
							Tapping Screw	48		6.6667
6	Mezannine	K2	800	400	3000	7.2	Phenolic Plywood	7.2	2.4187	0.4167
							Hollow Iron	56.64	9.44	1.3889
							Tie Rod	3.6	1.2	0.2778
							Wing Nut	12		1.6667
							Tapping Screw	48		6.6667

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Material Coefficient Analysis of Knock Down Formwork										
No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
7	3	K2	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727
8	3	K1	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727

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Material Coefficient Analysis of Knock Down Formwork

No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
9	3	K1	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727
10	3	K2	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727

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Material Coefficient Analysis of Knock Down Formwork										
No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
11	4	K3	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727
12	4	K3	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727

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Material Coefficient Analysis of Knock Down Formwork

No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
13	4	K2	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727
14	4	K2	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727

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Material Coefficient Analysis of Knock Down Formwork

No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
15	4	K1	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727
16	4	K2	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727

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Material Coefficient Analysis of Knock Down Formwork

No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
17	4	K2	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727
18	4	K1	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727

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Material Coefficient Analysis of Knock Down Formwork										
No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
19	4	K1	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727
20	4	K2	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727

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Material Coefficient Analysis of Knock Down Formwork										
No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
21	4	K2	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727
22	5	K1	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727

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Material Coefficient Analysis of Knock Down Formwork

No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
23	5	K1	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727
24	5	K1	700	400	3000	6.6	Phenolic Plywood	6.6	2.2171	0.4545
							Hollow Iron	55.24	9.2067	1.5152
							Tie Rod	3.6	1.2	0.3030
							Wing Nut	12		1.8182
							Tapping Screw	48		7.2727

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Material Coefficient Analysis of Knock Down Formwork

No.	Floor	Type of Column	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
25	5	K1	600	400	3000	6	Phenolic Plywood	6	2.0156	0.5
							Hollow Iron	53.84	8.9733	2
							Tie Rod	3.6	1.2	0.3333
							Wing Nut	12		2
							Tapping Screw	48		8
							Average			
							Phenolic Plywood			**0.4473**
							Hollow Iron			**1.4787**
							Tie Rod			**0.2982**
							Wing Nut			**1.7891**
							Tapping Screw			**7.1564**

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Conventional Formwork

Material Coefficient Analysis of Conventional Formwork										
No.	Floor	Type	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
1	1	K2	400	400	3000	4.8	Plywood	4.8	1.6125	0.4167
							Kaso Timber	39.84	13.28	2.9167
							Nails	5		1.0417
2	1	K2	400	400	3000	4.8	Plywood	4.8	1.6125	0.4167
							Kaso Timber	39.84	13.28	2.9167
							Nails	5		1.0417
3	1	K2	400	400	3000	4.8	Plywood	4.8	1.6125	0.4167
							Kaso Timber	39.84	13.28	2.9167
							Nails	5		1.0417
4	1	K2	400	400	3000	4.8	Plywood	4.8	1.6125	0.4167
							Kaso Timber	39.84	13.28	2.9167
							Nails	5		1.0417

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Material Coefficient Analysis of Conventional Formwork									
No.	Floor	Type	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
5	1	K1	500	400	3000	5.4	Plywood	5.4	1.8140	0.3704
							Kaso Timber	42.04	14.0133	2.7778
							Nails	5		0.9259
6	1	K1	500	400	3000	5.4	Plywood	5.4	1.8140	0.3704
							Kaso Timber	42.04	14.0133	2.7778
							Nails	5		0.9259
7	1	K1	500	400	3000	5.4	Plywood	5.4	1.8140	0.3704
							Kaso Timber	42.04	14.0133	2.7778
							Nails	5		0.9259
8	1	K1	500	400	3000	5.4	Plywood	5.4	1.8140	0.3704
							Kaso Timber	42.04	14.0133	2.7778
							Nails	5		0.9259

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Material Coefficient Analysis of Conventional Formwork										
No.	Floor	Type	Dimension (mm)		Height (mm)	Area (m^2)	Materials	Used	Planned	Materials Coefficient
			Length	Width						
9	1	K1	500	400	3000	5.4	Plywood	5.4	1.8140	0.3704
							Kaso Timber	42.04	14.0133	2.7778
							Nails	5		0.9259
10	1	K2	400	400	3000	4.8	Plywood	4.8	1.6125	0.4167
							Kaso Timber	39.84	13.28	2.9167
							Nails	5		1.0417
							Average			
							Plywood			**0.3935**
							***Kaso* Timber**			**2.8472**
							Nails			**0.9838**

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APPENDIX 6

MATERIALS UNIT PRICE AND WORKERS WAGE

Materials Unit Price				
No.	**Materials**	**Unit**	**Unit Price**	**Description**
1	Phenolic Plywood	sheet	Rp 480,000	1 sheet = 1.22 x 2.44 m and thickness of 18 mm
2	Hollow Iron	rod	Rp 160,160	1 rod with dimension 40x50 mm and length of 6 m
3	Tie Rod	pc	Rp 90,000	1 pc with diameter 16 mm and length of 3 m
4	Wing Nut	pc	Rp 30,800	
5	Tapping Screw	pc	Rp 150	1 pc with length of 4 cm
6	Plywood	sheet	Rp 135,000	1 sheet = 1.22 x 2.44 m and thickness of 12 mm
7	*Kaso* Timber	rod	Rp 22,000	1 rod with dimension 5/7 and length of 3 m
8	Nails	kg	Rp 15,000	1 pc with length of 10 cm

Workers Wage				
No.	**Manpower**	**Unit**	**Wage**	
Knock Down Formwork				
1	Worker	OH	Rp	90,000
2	Chief Worker	OH	Rp	95,000
3	Vice Foreman	OH	Rp	110,000
4	Foreman	OH	Rp	120,000
Conventional Formwork				
1	Labor	OH	Rp	85,000
2	Worker	OH	Rp	95,000
3	Chief Worker	OH	Rp	105,000
4	Foreman	OH	Rp	115,000

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APPENDIX 7
COST ANALYSIS DATA

Knock Down Formwork

Cost Analysis of Knock Down Formwork												
No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			area x cost / m²
1	K2	Phenolic Plywood	0.4167	Rp 480,000	Rp 200,000	Worker	0.1185	Rp 90,000	Rp 10,665	Rp 513,205	7.2	Rp 3,695,078
		Hollow Iron	1.3889	Rp 160,160	Rp 222,444	Chief Worker	0.0085	Rp 95,000	Rp 808			
		Tie Rod	0.2778	Rp 90,000	Rp 25,000	Vice Foreman	0.0085	Rp 110,000	Rp 935			
		Wing Nut	1.6667	Rp 30,800	Rp 51,333	Foreman	0.0085	Rp 120,000	Rp 1,020			
		Tapping Screw	6.6667	Rp 150	Rp 1,000							
				Total :	**Rp 499,778**			**Total :**	**Rp 13,428**			
2	K2	Phenolic Plywood	0.4167	Rp 480,000	Rp 200,000	Worker	0.1371	Rp 90,000	Rp 12,339	Rp 515,302	7.2	Rp 3,710,173
		Hollow Iron	1.3889	Rp 160,160	Rp 222,444	Chief Worker	0.0098	Rp 95,000	Rp 931			
		Tie Rod	0.2778	Rp 90,000	Rp 25,000	Vice Foreman	0.0098	Rp 110,000	Rp 1,078			
		Wing Nut	1.6667	Rp 30,800	Rp 51,333	Foreman	0.0098	Rp 120,000	Rp 1,176			
		Tapping Screw	6.6667	Rp 150	Rp 1,000							
				Total :	**Rp 499,778**			**Total :**	**Rp 15,524**			
3	K2	Phenolic Plywood	0.4167	Rp 480,000	Rp 200,000	Worker	0.1318	Rp 90,000	Rp 11,862	Rp 514,695	7.2	Rp 3,705,802
		Hollow Iron	1.3889	Rp 160,160	Rp 222,444	Chief Worker	0.0094	Rp 95,000	Rp 893			
		Tie Rod	0.2778	Rp 90,000	Rp 25,000	Vice Foreman	0.0094	Rp 110,000	Rp 1,034			
		Wing Nut	1.6667	Rp 30,800	Rp 51,333	Foreman	0.0094	Rp 120,000	Rp 1,128			
		Tapping Screw	6.6667	Rp 150	Rp 1,000							
				Total :	**Rp 499,778**			**Total :**	**Rp 14,917**			

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Cost Analysis of Knock Down Formwork

No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price area x cost / m²
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			
4	K2	Phenolic Plywood	0.4167	Rp 480,000	Rp 200,000	Worker	0.1559	Rp 90,000	Rp 14,031	Rp 517,416	7.2	Rp 3,725,397
		Hollow Iron	1.3889	Rp 160,160	Rp 222,444	Chief Worker	0.0111	Rp 95,000	Rp 1,055			
		Tie Rod	0.2778	Rp 90,000	Rp 25,000	Vice Foreman	0.0111	Rp 110,000	Rp 1,221			
		Wing Nut	1.6667	Rp 30,800	Rp 51,333	Foreman	0.0111	Rp 120,000	Rp 1,332			
		Tapping Screw	6.6667	Rp 150	Rp 1,000							
				Total :	**Rp 499,778**			**Total :**	**Rp 17,639**			
5	K5	Phenolic Plywood	0.4167	Rp 480,000	Rp 200,000	Worker	0.1162	Rp 90,000	Rp 10,458	Rp 498,697	7.2	Rp 3,590,617
		Hollow Iron	1.3	Rp 160,160	Rp 208,208	Chief Worker	0.0083	Rp 95,000	Rp 789			
		Tie Rod	0.2778	Rp 90,000	Rp 25,000	Vice Foreman	0.0083	Rp 110,000	Rp 913			
		Wing Nut	1.6667	Rp 30,800	Rp 51,333	Foreman	0.0083	Rp 120,000	Rp 996			
		Tapping Screw	6.6667	Rp 150	Rp 1,000							
				Total :	**Rp 485,541**			**Total :**	**Rp 13,156**			
6	K2	Phenolic Plywood	0.4167	Rp 480,000	Rp 200,000	Worker	0.1337	Rp 90,000	Rp 12,033	Rp 514,931	7.2	Rp 3,707,502
		Hollow Iron	1.3889	Rp 160,160	Rp 222,444	Chief Worker	0.0096	Rp 95,000	Rp 912			
		Tie Rod	0.2778	Rp 90,000	Rp 25,000	Vice Foreman	0.0096	Rp 110,000	Rp 1,056			
		Wing Nut	1.6667	Rp 30,800	Rp 51,333	Foreman	0.0096	Rp 120,000	Rp 1,152			
		Tapping Screw	6.6667	Rp 150	Rp 1,000							
				Total :	**Rp 499,778**			**Total :**	**Rp 15,153**			
7	K2	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1688	Rp 90,000	Rp 15,192	Rp 564,337	6.6	Rp 3,724,622
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0121	Rp 95,000	Rp 1,150			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0121	Rp 110,000	Rp 1,331			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0121	Rp 120,000	Rp 1,452			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 19,125**			

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Cost Analysis of Knock Down Formwork

No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price area x cost / m²
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			
8	K1	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1369	Rp 90,000	Rp 12,321	Rp 560,718	6.6	Rp 3,700,740
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0098	Rp 95,000	Rp 931			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0098	Rp 110,000	Rp 1,078			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0098	Rp 120,000	Rp 1,176			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 15,506**			
9	K1	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1501	Rp 90,000	Rp 13,509	Rp 562,199	6.6	Rp 3,710,511
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0107	Rp 95,000	Rp 1,017			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0107	Rp 110,000	Rp 1,177			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0107	Rp 120,000	Rp 1,284			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 16,987**			
10	K2	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1445	Rp 90,000	Rp 13,005	Rp 561,565	6.6	Rp 3,706,327
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0103	Rp 95,000	Rp 979			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0103	Rp 110,000	Rp 1,133			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0103	Rp 120,000	Rp 1,236			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 16,353**			
11	K3	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1492	Rp 90,000	Rp 13,428	Rp 562,118	6.6	Rp 3,709,976
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0107	Rp 95,000	Rp 1,017			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0107	Rp 110,000	Rp 1,177			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0107	Rp 120,000	Rp 1,284			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 16,906**			

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Cost Analysis of Knock Down Formwork

No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			area x cost / m²
12	K3	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1349	Rp 90,000	Rp 12,141	Rp 560,473	6.6	Rp 3,699,123
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0096	Rp 95,000	Rp 912			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0096	Rp 110,000	Rp 1,056			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0096	Rp 120,000	Rp 1,152			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 15,261**			
13	K2	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1515	Rp 90,000	Rp 13,635	Rp 562,357	6.6	Rp 3,711,557
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0108	Rp 95,000	Rp 1,026			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0108	Rp 110,000	Rp 1,188			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0108	Rp 120,000	Rp 1,296			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 17,145**			
14	K2	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1465	Rp 90,000	Rp 13,185	Rp 561,810	6.6	Rp 3,707,944
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0105	Rp 95,000	Rp 998			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0105	Rp 110,000	Rp 1,155			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0105	Rp 120,000	Rp 1,260			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 16,598**			
15	K1	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1334	Rp 90,000	Rp 12,006	Rp 560,306	6.6	Rp 3,698,017
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0095	Rp 95,000	Rp 903			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0095	Rp 110,000	Rp 1,045			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0095	Rp 120,000	Rp 1,140			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 15,094**			

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Cost Analysis of Knock Down Formwork

No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			area x cost / m²
16	K2	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.163	Rp 90,000	Rp 14,670	Rp 563,652	6.6	Rp 3,720,104
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0116	Rp 95,000	Rp 1,102			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0116	Rp 110,000	Rp 1,276			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0116	Rp 120,000	Rp 1,392			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 18,440**			
17	K2	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1282	Rp 90,000	Rp 11,538	Rp 559,740	6.6	Rp 3,694,285
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0092	Rp 95,000	Rp 874			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0092	Rp 110,000	Rp 1,012			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0092	Rp 120,000	Rp 1,104			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 14,528**			
18	K1	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.155	Rp 90,000	Rp 13,950	Rp 562,770	6.6	Rp 3,714,280
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0111	Rp 95,000	Rp 1,055			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0111	Rp 110,000	Rp 1,221			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0111	Rp 120,000	Rp 1,332			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 17,558**			
19	K1	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1355	Rp 90,000	Rp 12,195	Rp 560,560	6.6	Rp 3,699,694
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0097	Rp 95,000	Rp 922			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0097	Rp 110,000	Rp 1,067			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0097	Rp 120,000	Rp 1,164			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 15,348**			

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Cost Analysis of Knock Down Formwork

No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price area x cost / m²
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			
20	K2	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1479	Rp 90,000	Rp 13,311	Rp 561,968	6.6	Rp 3,708,990
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0106	Rp 95,000	Rp 1,007			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0106	Rp 110,000	Rp 1,166			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0106	Rp 120,000	Rp 1,272			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 16,756**			
21	K2	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1549	Rp 90,000	Rp 13,941	Rp 562,761	6.6	Rp 3,714,220
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0111	Rp 95,000	Rp 1,055			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0111	Rp 110,000	Rp 1,221			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0111	Rp 120,000	Rp 1,332			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 17,549**			
22	K1	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1518	Rp 90,000	Rp 13,662	Rp 562,384	6.6	Rp 3,711,735
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0108	Rp 95,000	Rp 1,026			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0108	Rp 110,000	Rp 1,188			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0108	Rp 120,000	Rp 1,296			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 17,172**			
23	K1	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1419	Rp 90,000	Rp 12,771	Rp 561,266	6.6	Rp 3,704,353
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0101	Rp 95,000	Rp 960			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0101	Rp 110,000	Rp 1,111			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0101	Rp 120,000	Rp 1,212			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 16,054**			

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Cost Analysis of Knock Down Formwork

No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			area x cost / m²
24	K1	Phenolic Plywood	0.4545	Rp 480,000	Rp 218,182	Worker	0.1576	Rp 90,000	Rp 14,184	Rp 563,069	6.6	Rp 3,716,253
		Hollow Iron	1.5152	Rp 160,160	Rp 242,667	Chief Worker	0.0113	Rp 95,000	Rp 1,074			
		Tie Rod	0.3030	Rp 90,000	Rp 27,273	Vice Foreman	0.0113	Rp 110,000	Rp 1,243			
		Wing Nut	1.8182	Rp 30,800	Rp 56,000	Foreman	0.0113	Rp 120,000	Rp 1,356			
		Tapping Screw	7.2727	Rp 150	Rp 1,091							
				Total :	**Rp 545,212**			**Total :**	**Rp 17,857**			
25	K1	Phenolic Plywood	0.5	Rp 480,000	Rp 240,000	Worker	0.1303	Rp 90,000	Rp 11,727	Rp 587,790	6	Rp 3,526,737
		Hollow Iron	1.5	Rp 160,160	Rp 240,240	Chief Worker	0.0093	Rp 95,000	Rp 884			
		Tie Rod	0.3333	Rp 90,000	Rp 30,000	Vice Foreman	0.0093	Rp 110,000	Rp 1,023			
		Wing Nut	2	Rp 30,800	Rp 61,600	Foreman	0.0093	Rp 120,000	Rp 1,116			
		Tapping Screw	8	Rp 150	Rp 1,200							
				Total :	**Rp 573,040**			**Total :**	**Rp 14,750**			

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Conventional Formwork

Cost Analysis of Conventional Formwork												
No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price area x cost / m²
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			
1	K2	Plywood	0.4167	Rp 135,000	Rp 56,250	Labors	0.5667	Rp 85,000	Rp 48,170	Rp 221,518	4.8	Rp 1,063,287
		Kaso Timber	2.9167	Rp 22,000	Rp 64,167	Workers	0.2834	Rp 95,000	Rp 26,923			
		Nails	1.0417	Rp 15,000	Rp 15,625	Chief Worker	0.0472	Rp 105,000	Rp 4,956			
						Foreman	0.0472	Rp 115,000	Rp 5,428			
				Total :	**Rp 136,042**			**Total :**	**Rp 85,477**			
2	K2	Plywood	0.4167	Rp 135,000	Rp 56,250	Labors	0.5198	Rp 85,000	Rp 44,183	Rp 214,441	4.8	Rp 1,029,318
		Kaso Timber	2.9167	Rp 22,000	Rp 64,167	Workers	0.2599	Rp 95,000	Rp 24,691			
		Nails	1.0417	Rp 15,000	Rp 15,625	Chief Worker	0.0433	Rp 105,000	Rp 4,547			
						Foreman	0.0433	Rp 115,000	Rp 4,980			
				Total :	**Rp 136,042**			**Total :**	**Rp 78,400**			
3	K2	Plywood	0.4167	Rp 135,000	Rp 56,250	Labors	0.5314	Rp 85,000	Rp 45,169	Rp 216,198	4.8	Rp 1,037,751
		Kaso Timber	2.9167	Rp 22,000	Rp 64,167	Workers	0.2657	Rp 95,000	Rp 25,242			
		Nails	1.0417	Rp 15,000	Rp 15,625	Chief Worker	0.0443	Rp 105,000	Rp 4,652			
						Foreman	0.0443	Rp 115,000	Rp 5,095			
				Total :	**Rp 136,042**			**Total :**	**Rp 80,157**			
4	K2	Plywood	0.4167	Rp 135,000	Rp 56,250	Labors	0.5578	Rp 85,000	Rp 47,413	Rp 220,180	4.8	Rp 1,056,865
		Kaso Timber	2.9167	Rp 22,000	Rp 64,167	Workers	0.2789	Rp 95,000	Rp 26,496			
		Nails	1.0417	Rp 15,000	Rp 15,625	Chief Worker	0.0465	Rp 105,000	Rp 4,883			
						Foreman	0.0465	Rp 115,000	Rp 5,348			
				Total :	**Rp 136,042**			**Total :**	**Rp 84,139**			

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Cost Analysis of Conventional Formwork

No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price area x cost / m²
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			
5	K1	Plywood	0.3704	Rp 135,000	Rp 50,000	Labors	0.4499	Rp 85,000	Rp 38,242	Rp 192,857	5.4	Rp 1,041,428
		Kaso Timber	2.7778	Rp 22,000	Rp 61,111	Workers	0.2249	Rp 95,000	Rp 21,366			
		Nails	0.9259	Rp 15,000	Rp 13,889	Chief Worker	0.0375	Rp 105,000	Rp 3,938			
						Foreman	0.0375	Rp 115,000	Rp 4,313			
				Total :	**Rp 125,000**			**Total :**	**Rp 67,857**			
6	K1	Plywood	0.3704	Rp 135,000	Rp 50,000	Labors	0.4434	Rp 85,000	Rp 37,689	Rp 191,869	5.4	Rp 1,036,090
		Kaso Timber	2.7778	Rp 22,000	Rp 61,111	Workers	0.2217	Rp 95,000	Rp 21,062			
		Nails	0.9259	Rp 15,000	Rp 13,889	Chief Worker	0.0369	Rp 105,000	Rp 3,875			
						Foreman	0.0369	Rp 115,000	Rp 4,244			
				Total :	**Rp 125,000**			**Total :**	**Rp 66,869**			
7	K1	Plywood	0.3704	Rp 135,000	Rp 50,000	Labors	0.4907	Rp 85,000	Rp 41,710	Rp 199,021	5.4	Rp 1,074,711
		Kaso Timber	2.7778	Rp 22,000	Rp 61,111	Workers	0.2454	Rp 95,000	Rp 23,313			
		Nails	0.9259	Rp 15,000	Rp 13,889	Chief Worker	0.0409	Rp 105,000	Rp 4,295			
						Foreman	0.0409	Rp 115,000	Rp 4,704			
				Total :	**Rp 125,000**			**Total :**	**Rp 74,021**			
8	K1	Plywood	0.3704	Rp 135,000	Rp 50,000	Labors	0.4967	Rp 85,000	Rp 42,220	Rp 199,916	5.4	Rp 1,079,546
		Kaso Timber	2.7778	Rp 22,000	Rp 61,111	Workers	0.2483	Rp 95,000	Rp 23,589			
		Nails	0.9259	Rp 15,000	Rp 13,889	Chief Worker	0.0414	Rp 105,000	Rp 4,347			
						Foreman	0.0414	Rp 115,000	Rp 4,761			
				Total :	**Rp 125,000**			**Total :**	**Rp 74,916**			

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Cost Analysis of Conventional Formwork

No.	Type of Column	Materials				Manpower				Cost / m²	Area (m²)	Total Price
		Item	Coefficient	Unit Price	Total	Item	Coefficient	Unit Price	Total			area x cost / m²
9	K1	Plywood	0.3704	Rp 135,000	Rp 50,000	Labors	0.5138	Rp 85,000	Rp 43,673	Rp 202,495	5.4	Rp 1,093,470
		Kaso Timber	2.7778	Rp 22,000	Rp 61,111	Workers	0.2569	Rp 95,000	Rp 24,406			
		Nails	0.9259	Rp 15,000	Rp 13,889	Chief Worker	0.0428	Rp 105,000	Rp 4,494			
						Foreman	0.0428	Rp 115,000	Rp 4,922			
				Total :	**Rp 125,000**			**Total :**	**Rp 77,495**			
10	K2	Plywood	0.4167	Rp 135,000	Rp 56,250	Labors	0.5544	Rp 85,000	Rp 47,124	Rp 219,664	4.8	Rp 1,054,386
		Kaso Timber	2.9167	Rp 22,000	Rp 64,167	Workers	0.2772	Rp 95,000	Rp 26,334			
		Nails	1.0417	Rp 15,000	Rp 15,625	Chief Worker	0.0462	Rp 105,000	Rp 4,851			
						Foreman	0.0462	Rp 115,000	Rp 5,313			
				Total :	**Rp 136,042**			**Total :**	**Rp 83,622**			

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APPENDIX 8

DOCUMENTATION

No.	Photo	Description
1		Marking Column was done before the formwork panel installation
2		Formwork Panel Installation was done using tower crane.
3		Clamp Process (lock the formwork by using wing nut)

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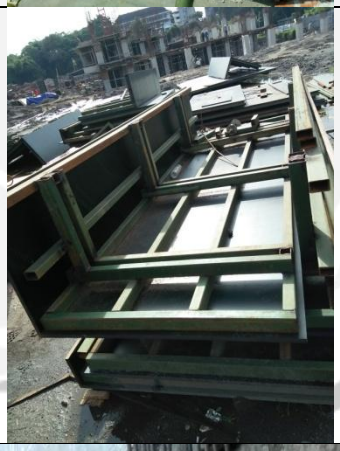
No.	Photo	Description
3		Support Installation.
4		Formwork Panel during maintenance.
5		Conventional Formwork in detail.

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No.	Photo	Description
6		Conventional Formwork in Kencana Shop and House Project.
7		Plywood wastes from conventional formwork.