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Appendix A Questionnaire

**QUESTIONNAIRE FOR DATA COLLECTION ON AIR CONDITIONING SYSTEM OF AFHQ BUILDING**


(Please answer all questions)

1. Directorate/Command section :
2. Floor :
3. Working place (Please tick respective box according to the floor plan)
 

A:       B:       C:       D:

E:       F:       G:       H:
4. Condition of indoor environment (Please enter the date and tick the respective column)

Table A.1 Data from occupants

Date	Time	Cold	Normal	Hot
	0800-1200			
	1300-1600			
	0800-1200			
	1300-1600			
	0800-1200			
	1300-1600			
	0800-1200			
	1300-1600			
	0800-1200			
	1300-1600			
	0800-1200			
	1300-1600			
	0800-1200			
	1300-1600			
	0800-1200			
	1300-1600			

5. Rank and Name :

Appendix B Temperature measurements at the floors

Table B.1 Temperature of Basement

Date	Time	Temperature/(°C)					
		A(The/stat)	B	C	D	E	F
08/01/2013	0800	27	27.2	26.2	26	25.8	28.3
	1100	26.2	26.2	25.8	25.9	25.2	25.8
	1300	26.1	26.1	25.8	26.1	24.8	25.2
	1500	26.1	25.9	25.9	26.2	24.9	25.4
	1730	26.1	26	26	26.1	25	25.2
11/02/2013	0800	26.9	26.8	26.8	26.7	26.7	27.5
	1100	26.3	25.9	26.3	26.2	26.1	25.8
	1300	26.1	25.5	25.9	26	25.9	26.2
	1500	26	25.6	25.02	25.09	25.8	25.4
	1730	25.9	25.1	25.1	25.05	25.4	25.2
18/03/2013	0800	26	25.4	25.03	25.1	25.8	24.6
	1100	25.8	25.4	25.02	25.1	25.6	25.6
	1300	26.1	25.4	25.03	25.5	25.5	25.2
	1500	26	25.3	25.04	25.5	25.4	25.4
	1730	25.1	25.1	25.03	25.1	25.3	24.8
26/03/2013	0800	25.05	26.2	25.09	25.06	25.02	25.0
	1100	25.01	26	25.04	25.02	25	25.3
	1300	25.04	26.02	26.1	25.08	25.07	25.0
	1500	25.02	26.04	26.02	25.09	25.05	25.1
	1730	25.09	26.09	25.08	25.07	25.04	25.6
04/04/2013	0800	23.6	25.3	24.8	24.9	24.5	24.6
	1100	25.9	26.2	25.6	25.7	25.4	25.6
	1300	25.7	26.1	25.8	26.1	24.8	25.2
	1500	26.0	25.9	25.9	26.2	24.9	25.4

Table B.2 Temperature of Ground Floor

Date	Time	Temperature/(°C)					
		A(The/stat)	B	C	D	E	F
08/01/2013	0800	25.5	25.3	25.1	24.8	25.7	25.3
	1100	25.3	24.5	25.8	24.9	25.5	25.1
	1300	25.6	24.8	27.8	25.8	25.9	25.7
	1500	26.5	26.5	26.8	26.7	27.3	27.4
	1730	27.5	27.5	25.5	28.2	28.5	28.3
12/02/2013	0800	26.2	25.3	25.7	26.1	26.2	26.3
	1100	26.2	25.4	25.6	25.8	25.6	25.7
	1300	26.5	25.4	25.5	25.8	25.6	26.0
	1500	26.1	25.4	25.8	26.1	26.1	26.0
	1730	15.9	25.03	25.6	25.09	25.8	26.0

<b>19/03/2013</b>	<b>0800</b>	26.01	26.2	26.4	26	26.02	26.0
	<b>1100</b>	26.02	26.01	26.03	26.04	26.01	26.2
	<b>1300</b>	26.04	26	26.01	26.02	26.01	26.1
	<b>1500</b>	26.05	26.1	26.02	26.04	26.02	26.9
	<b>1730</b>	26.03	26	25.9	25.9	26	26.4
<b>05/04/2013</b>	<b>0800</b>	25.1	25.5	25.2	25.3	25.0	25.1
	<b>1100</b>	25.2	25.5	25.6	25.4	25.7	25.5
	<b>1300</b>	24.3	25	25.4	25.3	25.6	25.8
	<b>1500</b>	24.6	24.8	24.6	25.0	24.6	26.9
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1
<b>24/04/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.6
	<b>1100</b>	24	25	24.2	23.9	23.7	23.1
	<b>1300</b>	24.1	24.5	24.2	23.9	24.1	23.2
	<b>1500</b>	24.3	24.1	24.4	24.4	24.9	24.2
	<b>1730</b>	24.5	24.4	24.5	24.5	24.1	24.5

Table B.3 Temperature of 1<sup>st</sup> Floor

<b>Date</b>	<b>Time</b>	<b>Temperature/(°C)</b>					
		<b>A(The/stat)</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<b>14/01/2013</b>	<b>0800</b>	25.9	26.8	26	25.9	26.2	24.3
	<b>1100</b>	25	26.1	26	25.1	25.03	24.1
	<b>1300</b>	25.1	24.9	24.9	25.1	25.2	24.0
	<b>1500</b>	24.8	25.9	24.7	24.9	25.8	24.4
	<b>1730</b>	24.1	25.2	24.1	24.2	25	24.5
<b>12/02/2013</b>	<b>0800</b>	23.9	24.2	23.9	24.1	24.6	23.9
	<b>1100</b>	24	24.4	24.1	24.5	24.9	23.2
	<b>1300</b>	24.1	24.6	24.8	25.1	25.8	23.0
	<b>1500</b>	24.1	24.9	25.4	25.1	25.2	23.7
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1
<b>17/02/2013</b>	<b>0800</b>	24	25.4	24.1	23.9	23.5	23.3
	<b>1100</b>	24	25	24.2	23.9	23.7	23.1
	<b>1300</b>	24.1	24.5	24.2	23.9	24.1	23.2
	<b>1500</b>	24.3	24.4	24.3	24	24.2	23.0
	<b>1730</b>	24	24.1	24	24.1	24	22.8
<b>06/03/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.6
	<b>1100</b>	25.2	25.3	25.5	25.2	25.6	25.0
	<b>1300</b>	24.1	24.5	24.2	23.9	24.1	23.2
	<b>1500</b>	24.3	24.1	24.4	24.4	24.9	24.2
	<b>1730</b>	24.5	24.4	24.5	24.5	24.1	24.5
<b>08/04/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	24.6
	<b>1100</b>	25.2	25.5	25.6	25.4	25.7	25.1
	<b>1300</b>	24.3	25	25.4	25.3	25.6	25.2
	<b>1500</b>	25.1	24.1	24.0	24.5	24.1	24.2
	<b>1730</b>	25.2	25.2	24.2	24.1	24.0	24.1

Table B.4 Temperature of 2<sup>nd</sup> Floor

Date	Time	Temperature/(°C)					
		A(The/stat)	B	C	D	E	F
14/01/2013	0800	24	26.1	25.9	26.2	26	25.5
	1100	24.2	26.2	26	27	26.1	25.4
	1300	23	25.9	25.9	25.2	24.9	24.7
	1500	24	26.8	27	25.8	25.2	24.9
	1730	24	26.1	26.03	25.1	25	24.2
12/02/2013	0800	25	25.6	26	26	26.01	25.8
	1100	25.2	25.5	25.6	25.4	25.7	25.0
	1300	24.3	25	25.4	25.3	25.6	25.0
	1500	24.1	24.9	25.4	25.1	25.2	25.1
	1730	24	24.6	25.1	24.9	25	24.8
26/02/2013	0800	24	24.7	24.9	25.1	24.7	23.8
	1100	24.2	24.3	24.7	24.9	24.3	23.5
	1300	24.5	24.6	24.8	24.9	24.5	23.5
	1500	24.6	24.8	24.6	24.5	24.1	23.6
	1730	24.4	24.3	24.3	24.1	24	23.5
07/03/2013	0800	23.09	24.03	24.01	24.06	24.07	23.6
	1100	23.06	24.01	24.02	24.03	24.04	23.7
	1300	23.09	24.05	24.06	24.8	24.7	23.4
	1500	23.08	24.06	24.03	24.07	24	23.2
	1730	23.06	24.05	24	24.2	24.02	23.2
22/04/2013	0800	25.1	25.5	25.2	25.3	25.0	25.1
	1100	25.2	25.3	25.5	25.2	25.6	25.0
	1300	24.1	24.5	24.2	23.9	24.1	23.2
	1500	24.6	24.8	24.6	25.0	24.6	23.3
	1730	24.0	24.0	24.0	24.0	24.0	23.1

Table B.5 Temperature of 3rd Floor

Date	Time	Temperature/(°C)					
		A(The/stat)	B	C	D	E	F
22/01/2013	0800	23.6	24.1	24.9	26.2	24.7	23.8
	1100	23.9	24.1	24.3	26.5	25.1	23.5
	1300	24.2	25	24.6	25.5	25.8	23.5
	1500	25.2	25.7	25.8	26.5	25.2	23.6
	1730	24.5	25.1	24.8	25.2	24.8	23.5
14/02/2013	0800	25	25.4	25.4	25.1	25.2	25.1
	1100	25	25.3	25.3	25.4	25.2	24.4
	1300	25.1	24.8	24.9	24.9	25.3	24.7
	1500	24.9	24.6	24.8	24.9	25.1	24.9
	1730	24.7	26.5	24.8	24.6	25.3	24.2
24/03/2013	0800	25.1	25.6	25.2	25.3	25.8	25.1
	1100	25.2	25.3	25.5	25.2	25.6	25.0
	1300	25.3	25.5	25.6	25.2	25.4	23.2

	<b>1500</b>	24.9	25.1	25.2	24.8	25	24.2
	<b>1730</b>	24.6	24.8	25	24.5	24.5	23.1
<b>10/04/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.6
	<b>1100</b>	24	25	24.2	23.9	23.7	23.1
	<b>1300</b>	24.1	24.5	24.2	23.9	24.1	23.2
	<b>1500</b>	25.1	24.1	24.0	24.5	24.1	24.2
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1
<b>22/04/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	24.6
	<b>1100</b>	25.2	25.3	25.5	25.2	25.6	24.0
	<b>1300</b>	24.1	24.5	24.2	23.9	24.1	23.2
	<b>1500</b>	24.3	24.1	24.4	24.4	24.9	24.2
	<b>1730</b>	24.5	24.4	24.5	24.5	24.1	24.5

Table B.6 Temperature of 4<sup>th</sup> Floor

Date	Time	Temperature/(°C)					
		A(The/stat)	B	C	D	E	F
<b>27/01/2013</b>	<b>0800</b>	24.9	24.3	24.5	24.8	24.9	24.6
	<b>1100</b>	25.4	24.4	24.8	24.2	23.9	23.1
	<b>1300</b>	24.5	23.6	24.1	25.8	23.7	23.2
	<b>1500</b>	25.9	25.3	25.5	26.1	24.9	23.6
	<b>1730</b>	25.3	25.2	25.3	25.3	24.4	23.1
<b>17/02/2013</b>	<b>0800</b>	24.3	23.6	23.8	23.2	23.3	23.0
	<b>1100</b>	24.5	23.6	23.8	23.2	23.4	23.1
	<b>1300</b>	24.5	23.9	24.01	23.7	23.9	23.2
	<b>1500</b>	24.4	23.9	23.8	23.7	23.8	23.2
	<b>1730</b>	23.2	23	23	22	22.5	22.1
<b>24/02/2013</b>	<b>0800</b>	23.5	23.2	23.1	22.8	22.9	22.9
	<b>1100</b>	24.2	24.1	24	23.2	23.8	23.2
	<b>1300</b>	25.1	25	25.5	25.8	25.1	24.6
	<b>1500</b>	25.1	24.1	24.0	24.5	24.1	24.2
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1
<b>19/03/2013</b>	<b>0800</b>	25.01	24.5	25.4	24	24.5	24.2
	<b>1100</b>	25.01	24.5	25.3	24.2	24.5	23.1
	<b>1300</b>	24.08	24.5	24.8	24.3	25	23.8
	<b>1500</b>	24.07	24.5	24.7	24.4	24.8	24.2
	<b>1730</b>	24.4	24.4	24.5	24.1	24.6	23.1
<b>11/04/2013</b>	<b>0800</b>	26.9	26.8	26.8	26.2	26.7	25.1
	<b>1100</b>	27	26.9	26.9	26.8	26.3	25
	<b>1300</b>	26.8	26.8	26.8	26.8	26.4	24.7.
	<b>1500</b>	26.6	26.2	26.2	26.1	26.1	24.5
	<b>1730</b>	24.9	24.7	24.6	24.3	24.2	24.1

Table B.7 Temperature of 5<sup>th</sup> Floor

Date	Time	Temperature/(°C)					
		A(The/stat)	B	C	D	E	F



<b>10/01/2013</b>	<b>0800</b>	25.2	25.2	24.8	25.5	26.1	25.5
	<b>1100</b>	24.4	25.5	25.0	26.1	26.0	25.9
	<b>1300</b>	25.1	25.1	24.8	25.5	25.6	25.8
	<b>1500</b>	26.0	26.0	24.8	25.6	25.8	26.0
	<b>1730</b>	24.9	25.1	24.2	25.1	25.0	25.2
<b>18/02/2013</b>	<b>0800</b>	27.3	27.1	28.2	28.5	28.0	28.5
	<b>1100</b>	24.7	25.1	25.0	25.3	25.6	26.1
	<b>1300</b>	24.6	25.1	25.2	25.1	25.2	26.4
	<b>1500</b>	24.5	25.2	25.1	25.9	25.2	26.8
	<b>1730</b>	24.3	25.0	24.9	25.1	25.1	25.6
<b>17/03/2013</b>	<b>0800</b>	26.0	26.1	25.9	25.7	25.9	26.1
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.7
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	25.6
	<b>1500</b>	25.2	25.0	24.8	24.2	24.6	25.1
	<b>1730</b>	24.9	24.6	24.5	24.0	24.3	24.9
<b>19/03/2013</b>	<b>0800</b>	24.0	24.7	24.8	24.2	24.5	25.2
	<b>1100</b>	24.1	24.5	24.5	24.0	24.2	24.8
	<b>1300</b>	24.5	24.8	24.7	24.2	24.8	24.9
	<b>1500</b>	24.7	24.9	24.6	24.4	24.9	24.8
	<b>1730</b>	24.3	24.5	24.2	24.1	24.5	24.6
<b>25/04/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.6
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.7
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	25.6
	<b>1500</b>	24.5	24.4	24.3	24	24.2	23.0
	<b>1730</b>	24	24.1	24	24	24	22.8



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Table B.8 Temperature of 6<sup>th</sup> Floor

<b>Date</b>	<b>Time</b>	<b>Temperature/(°C)</b>					
		<b>A(The/stat)</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<b>29/01/2013</b>	<b>0800</b>	26.2	26.2	26.7	26.8	26.7	26.9
	<b>1100</b>	24.8	24.9	25.1	25.6	25.0	25.9
	<b>1300</b>	24.7	24.5	24.3	24.7	24.6	26.2
	<b>1500</b>	24.7	24.6	25.3	25.3	25.4	26.7
	<b>1730</b>	24.3	24.2	24.5	24.5	24.1	24.2
<b>18/02/2013</b>	<b>0800</b>	25.0	25.1	25.2	25.6	25.0	25.0
	<b>1100</b>	24.8	24.8	24.3	24.6	24.5	25.3
	<b>1300</b>	24.4	24.8	24.3	25.1	24.6	26.8
	<b>1500</b>	24.6	24.8	24.6	25.0	24.6	26.9
	<b>1730</b>	24.6	24.6	24.3	24.8	24.6	26.8
<b>26/03/2013</b>	<b>0800</b>	25.6	24.1	24.0	24.0	24.2	25.9
	<b>1100</b>	24.9	24.2	24.0	24.0	24.0	26.0
	<b>1300</b>	24.8	24.0	24.1	24.1	24.0	26.1
	<b>1500</b>	24.6	24.1	24.2	24.2	24.2	25.1
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	25.1
<b>02/04/2013</b>	<b>0800</b>	26.1	26.3	26.7	26.9	26.6	27.1

	<b>1100</b>	26.6	26.1	24.5	26.7	26.8	27.0
	<b>1300</b>	26.1	26.2	26.4	26.5	26.3	26.9
	<b>1500</b>	26.0	26.1	26.5	26.6	26.2	26.8
	<b>1730</b>	25.5	25.2	25.1	26.0	25.9	26.0
<b>25/04/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.6
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.7
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	25.6
	<b>1500</b>	24.6	24.8	24.6	25.0	24.6	26.9
	<b>1730</b>	25.2	25.2	24.2	24.1	24.0	24.1

Table B.9 Temperature of 7<sup>th</sup> Floor

Date	Time	Temperature/(°C)					
		A(The/stat)	B	C	D	E	F
<b>29/01/2013</b>	<b>0800</b>	25.1	23.2	23.2	25.2	24.0	23.9
	<b>1100</b>	25.5	24.5	24.1	25.5	24.0	24.5
	<b>1300</b>	25.7	24.6	24.5	25.2	24.0	24.4
	<b>1500</b>	26.1	25.0	24.5	25.3	24.0	24.5
	<b>1730</b>	25.1	24.7	24.1	24.7	24.1	24.1
<b>21/02/2013</b>	<b>0800</b>	26.1	25.6	25.6	25.7	25.9	26.0
	<b>1100</b>	26.2	25.5	24.8	25.4	25.6	25.7
	<b>1300</b>	25.7	24.5	24.5	25.8	25.1	24.5
	<b>1500</b>	25.8	24.6	24.6	25.5	25.2	24.6
	<b>1730</b>	25.3	24.2	24.1	25.1	25.0	24.1
<b>17/03/2013</b>	<b>0800</b>	25.0	24.8	24.7	24.1	24.1	24.0
	<b>1100</b>	25.0	24.1	24.6	24.1	24.1	24.0
	<b>1300</b>	25.0	24.1	24.7	24.1	24.1	24.0
	<b>1500</b>	24.1	24.1	24.0	24.0	24.0	24.0
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1
<b>29/03/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.1
	<b>1100</b>	25.2	25.5	25.6	25.4	25.7	24.0
	<b>1300</b>	24.3	25	25.4	25.3	25.6	24.1
	<b>1500</b>	24.6	24.8	24.6	25.0	24.6	23.8
	<b>1730</b>	24.9	24.6	24.5	24.0	24.3	24.0
<b>20/04/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	24.6
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.0
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	24.6
	<b>1500</b>	24.3	24.1	24.4	24.4	24.9	24.2
	<b>1730</b>	24.5	24.4	24.5	24.5	24.1	23.5

Table B.10 Temperature of 8<sup>th</sup> Floor

Date	Time	Temperature/(°C)					
		A(The/stat)	B	C	D	E	F
<b>10/01/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.6
	<b>1100</b>	25.8	24.8	24.1	24.8	24.4	24.5
	<b>1300</b>	25.1	24.7	24.1	25.1	24.5	24.5
	<b>1500</b>	25.2	24.8	24.2	25.2	24.8	24.6

	<b>1730</b>	25.1	24.6	24.1	25.3	24.6	24.5
<b>18/02/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	24.6
	<b>1100</b>	25.3	25.1	24.8	24.3	24.1	24.5
	<b>1300</b>	25.4	25.2	24.5	24.4	24.2	24.5
	<b>1500</b>	25.5	25.4	24.4	24.3	24.5	24.5
	<b>1730</b>	25.2	25.2	24.2	24.1	24.0	24.1
<b>17/03/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.6
	<b>1100</b>	24	25	24.2	23.9	23.7	23.1
	<b>1300</b>	24.1	24.5	24.2	23.9	24.1	23.2
	<b>1500</b>	24.1	24.1	24.0	24.0	24.0	24.0
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1
<b>19/03/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	24.6
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.7
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	25.6
	<b>1500</b>	24.6	24.8	24.6	25.0	24.6	26.9
	<b>1730</b>	25.2	25.2	24.2	24.1	24.0	24.1
<b>25/04/2013</b>	<b>0800</b>	26.1	26.3	26.7	26.9	26.6	26.1
	<b>1100</b>	25.2	25.5	25.6	25.4	25.7	25.2
	<b>1300</b>	24.3	25	25.4	25.3	25.6	25.1
	<b>1500</b>	24.3	24.1	24.4	24.4	24.9	24.2
	<b>1730</b>	24.5	24.4	24.5	24.5	24.1	24.0

Table B.11 Temperature of 9<sup>th</sup> Floor

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Date	Time	Temperature/(°C)					
		A (The/stat)	B	C	D	E	F
<b>14/01/2013</b>	<b>0800</b>	24.9	25.1	24.1	23.0	23.2	23.5
	<b>1100</b>	24.1	24.8	23.1	22.9	22.9	23.2
	<b>1300</b>	25.1	25.0	24.5	23.1	23.2	23.8
	<b>1500</b>	24.8	25.1	24.3	23.1	23.2	23.8
	<b>1730</b>	24.5	24.9	24.1	23.2	23.1	23.6
<b>12/02/2013</b>	<b>0800</b>	26.6	24.9	24.3	24.5	23.9	24.0
	<b>1100</b>	26.5	24.8	24.1	23.9	23.9	23.9
	<b>1300</b>	25.8	24.8	24.0	23.8	23.5	23.6
	<b>1500</b>	25.7	24.7	24.0	23.8	23.4	23.8
	<b>1730</b>	24.9	24.6	24.5	24.0	24.3	24.9
<b>26/02/2013</b>	<b>0800</b>	25.1	25.5	25.2	25.3	25.0	25.1
	<b>1100</b>	24.8	24.9	25.1	24.6	24.1	24.4
	<b>1300</b>	25.2	25.6	25.8	24.9	25.6	25.8
	<b>1500</b>	25.6	25.7	25.2	25.4	25.7	25.1
	<b>1730</b>	25.1	25.0	25.0	25.1	25.2	24.9
<b>07/03/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.6
	<b>1100</b>	25.2	25.3	25.5	25.2	25.6	24.2
	<b>1300</b>	24.1	24.5	24.2	23.9	24.1	23.2
	<b>1500</b>	24.1	24.1	24.0	24.0	24.0	24.0
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1

<b>22/04/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	24.6
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.7
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	25.6
	<b>1500</b>	24.3	24.4	24.3	24	24.2	23.0
	<b>1730</b>	24	24.1	24	24.1	24	22.8

Table B 12 Temperature of 10<sup>th</sup> Floor

<b>Date</b>	<b>Time</b>	<b>Temperature/(°C)</b>					
		<b>A(The/stat)</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<b>10/01/2013</b>	<b>0800</b>	25.0	23.2	23.8	23.6	24.0	24.1
	<b>1100</b>	25.1	23.8	23.9	23.4	25.2	24.1
	<b>1300</b>	24.2	23.7	23.8	23.1	23.6	23.0
	<b>1500</b>	24.3	23.8	23.8	24.1	24.8	14.1
	<b>1730</b>	24.4	23.8	23.8	24.2	24.6	24.1
<b>18/02/2013</b>	<b>0800</b>	25.2	24.6	23.4	26.4	26.3	25.5
	<b>1100</b>	25.1	23.9	23.9	25.4	25.2	24.4
	<b>1300</b>	25.2	24.0	23.9	24.8	24.0	23.8
	<b>1500</b>	25.1	24.1	24.0	24.5	24.1	24.2
	<b>1730</b>	25.0	24.2	24.5	24.1	24.2	24.5
<b>17/03/2013</b>	<b>0800</b>	25.1	25.5	25.2	25.3	25.0	25.1
	<b>1100</b>	24.8	24.9	25.1	24.6	24.1	24.0
	<b>1300</b>	25.2	25.5	25.6	25.4	25.7	24.3
	<b>1500</b>	24.3	25	25.4	25.3	25.6	24.1
	<b>1730</b>	24.9	24.6	24.5	24.0	24.3	24.9
<b>19/03/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	24.6
	<b>1100</b>	24	25	24.2	23.9	23.7	23.1
	<b>1300</b>	24.1	24.5	24.2	23.9	24.1	23.2
	<b>1500</b>	24.6	24.8	24.6	25.0	24.6	26.9
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1
<b>25/04/2013</b>	<b>0800</b>	26.1	26.3	26.7	26.9	26.6	27.1
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.7
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	25.6
	<b>1500</b>	24.3	24.1	24.4	24.4	24.9	24.2
	<b>1730</b>	24.5	24.4	24.5	24.5	24.1	24.5

Table B.13 Temperature of 11<sup>th</sup> Floor

<b>Date</b>	<b>Time</b>	<b>Temperature/(°C)</b>					
		<b>A(The/stat)</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<b>14/01/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	24.6
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.7
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	25.6
	<b>1500</b>	24.3	24.1	24.4	24.4	24.9	24.2
	<b>1730</b>	24.5	24.4	24.5	24.5	24.1	24.5

<b>12/02/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.6
	<b>1100</b>	24	25	24.2	23.9	23.7	23.1
	<b>1300</b>	24.1	24.5	24.2	23.9	24.1	23.2
	<b>1500</b>	24.6	24.8	24.6	25.0	24.6	26.9
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1
<b>26/02/2013</b>	<b>0800</b>	25.1	25.5	25.2	25.3	25.0	25.1
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.7
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	25.6
	<b>1500</b>	25.1	24.1	24.0	24.5	24.1	24.2
	<b>1730</b>	24.9	25.1	24.2	25.1	25.0	25.2
<b>07/03/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	23.6
	<b>1100</b>	25.2	25.5	25.6	25.4	25.7	23.7
	<b>1300</b>	24.3	25	25.4	25.3	25.6	24.0
	<b>1500</b>	24.1	24.1	24.0	24.0	24.0	24.0
	<b>1730</b>	25.2	25.2	24.2	24.1	24.0	24.1
<b>22/04/2013</b>	<b>0800</b>	26.1	26.3	26.7	26.9	25.6	25.1
	<b>1100</b>	25.2	25.5	25.6	25.4	25.7	25.1
	<b>1300</b>	24.3	25	25.4	25.3	25.6	25.0
	<b>1500</b>	24.3	24.1	24.4	24.4	24.9	24.2
	<b>1730</b>	24.5	24.4	24.5	24.5	24.1	24.0

Table B.14 Temperature of 12<sup>th</sup> Floor

<b>Date</b>	<b>Time</b>	<b>Temperature/(°C)</b>					
		<b>A (The/stat)</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
<b>10/01/2013</b>	<b>0800</b>	24.9	23.9	24.2	24.2	24.7	24.5
	<b>1100</b>	24.1	24.1	24.2	24.3	24.6	24.1
	<b>1300</b>	24.7	24.5	24.3	24.5	24.5	24.0
	<b>1500</b>	24.3	24.1	24.4	24.4	24.9	24.2
	<b>1730</b>	24.5	24.4	24.5	24.5	24.1	24.5
<b>18/02/2013</b>	<b>0800</b>	24.0	24.1	24.3	24.5	24.1	24.4
	<b>1100</b>	23.9	24.0	24.2	24.4	24.0	24.1
	<b>1300</b>	24.2	24.4	24.5	24.7	24.3	24.5
	<b>1500</b>	24.1	24.2	24.3	24.5	24.1	24.4
	<b>1730</b>	23.8	23.9	24.1	24.5	24.0	24.1
<b>17/03/2013</b>	<b>0800</b>	26.1	26.3	26.7	26.9	26.6	26.2
	<b>1100</b>	25.2	25.5	25.6	25.4	25.7	25.4
	<b>1300</b>	24.3	25	25.4	25.3	25.6	25.2
	<b>1500</b>	24.6	24.8	24.6	25.0	24.6	26.9
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1
<b>19/03/2013</b>	<b>0800</b>	25.1	25.0	24.9	24.2	24.0	24.6
	<b>1100</b>	25.3	25.1	25.0	24.9	25.1	25.7
	<b>1300</b>	25.1	25.2	24.9	24.7	24.9	25.6
	<b>1500</b>	25.1	24.1	24.0	24.5	24.1	24.2
	<b>1730</b>	24.9	24.6	24.5	24.0	24.3	24.9
<b>25/04/2013</b>	<b>0800</b>	23.6	25.3	24.8	24.9	24.5	24.2

	<b>1100</b>	25.2	25.5	25.6	25.4	25.7	24.4
	<b>1300</b>	24.3	25	25.4	25.3	25.6	24.4
	<b>1500</b>	24.1	24.9	25.4	25.1	25.2	24.0
	<b>1730</b>	24.0	24.0	24.0	24.0	24.0	23.1



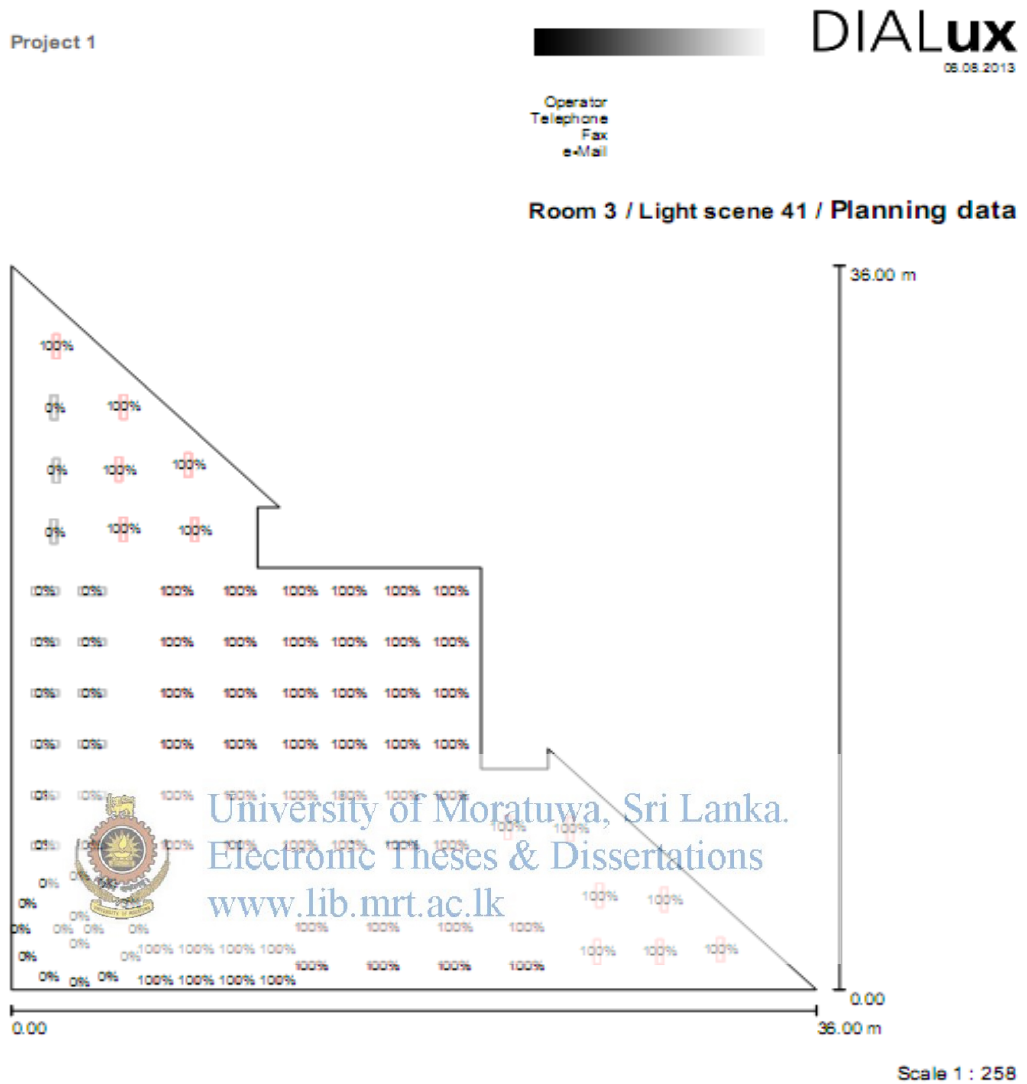
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## Appendix C Calculation of Simple payback period



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Appendix D Sample Calculations of luminance values by DIALux 4.11 software



**Daylight parameters:**

Location: Sri Jaywardanapura, Longitude: 79.90°, Latitude: 6.90°, North deviation: 20.0°  
 Date: 12.02.2013, Time: 16:00:00 (+6 hours difference to GMT)  
 Reference sky type: Clear sky

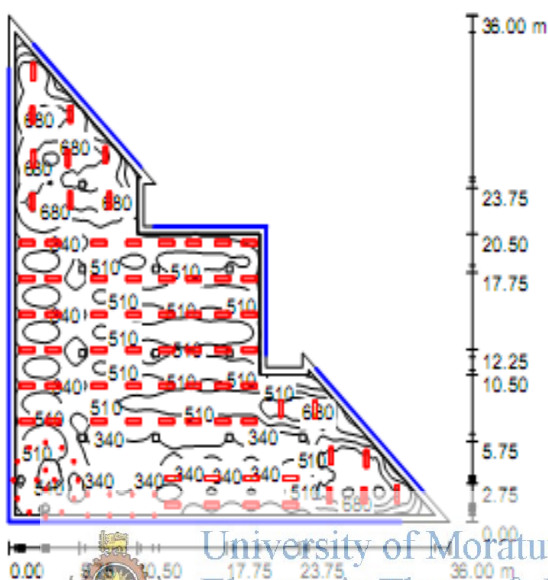
No.	Control group (Luminaire)	Dimming values (Total) [%]
1	Control group 1 (GELIGHTING - OL TOP/DBX PRAL S 218 EB EES CWL 835 Louvre)	0
2	Control group 2 (GELIGHTING - TL 5000 5508/228/16EB T5 CWL GE)	0
3	Control group 2 (GELIGHTING - TL 5000 5507/254/16EB T5 CWL GE)	0
4	Control group 3 (GELIGHTING - TL 5000 5508/228/16EB T5 CWL GE)	100
5	Control group 4 (GELIGHTING - OL TOP/DBX PRAL S 218 EB EES CWL 835 Louvre)	100
6	Control group 5 (GELIGHTING - OL TOP/DBX PRAL S 218 EB EES CWL 835 Louvre)	0
7	Control group 6 (GELIGHTING - TL 5000 5508/228/16EB T5 CWL GE)	100
8	Control group 7 (GELIGHTING - TL 5000 5507/254/16EB T5 CWL GE)	100
9	Control group 8 (GELIGHTING - TL 5000 5508/228/16EB T5 CWL GE)	0
	All other luminaires	100





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**Room 3 / Light scene 43 / Summary**



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Height of luminaire: 2.800 m, Maintenance factor: 0.80  
Values in Lux, Scale 1:463

Surface	$\rho$ [%]	$E_{av}$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	u0
Workplane	/	485	67	905	0.138
Floor	49	449	70	833	0.156
Ceiling	78	190	67	356	0.354
Walls (10)	50	205	53	453	/

**Workplane:**

Height: 0.750 m  
Grid: 128 x 128 Points  
Boundary Zone: 0.500 m

Illuminance Quotient (according to LG7): Walls / Working Plane: 0.329, Ceiling / Working Plane: 0.392.  
Proportion of points with less than 400 lx (for IEQ-7): 64.01%.

**Luminaire Parts List**

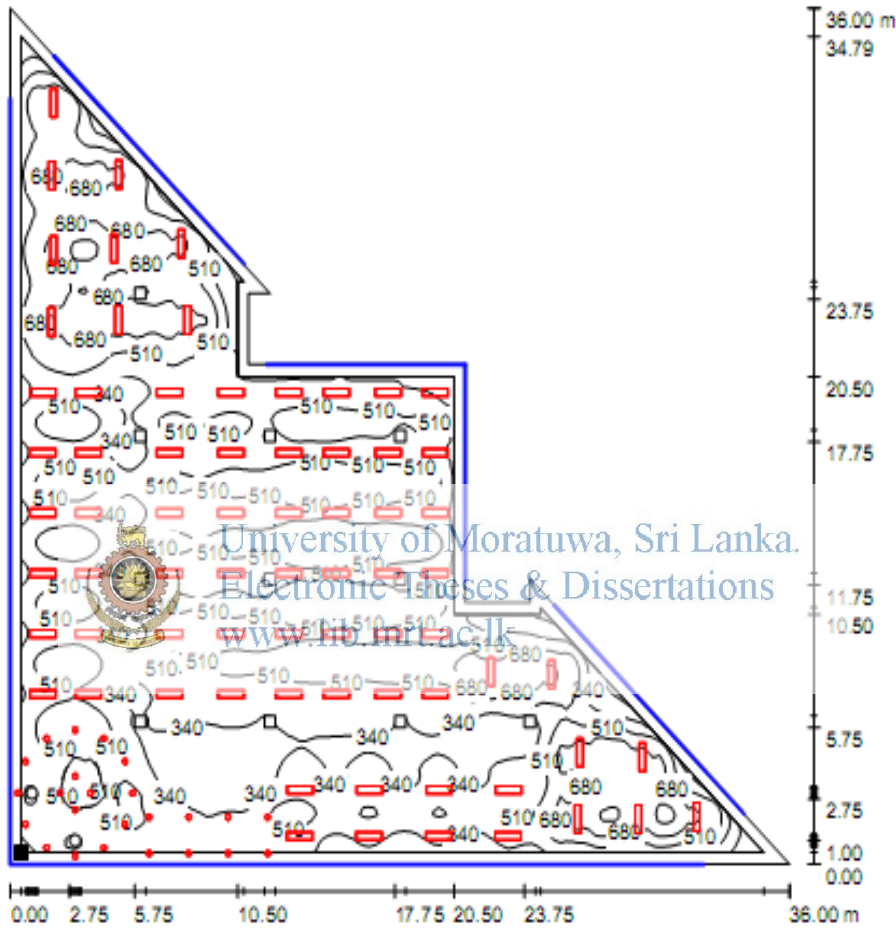
No.	Pieces	Designation (Correction Factor)	$\Phi$ (Luminaire) [lm]	$\Phi$ (Lamps) [lm]	P [W]
1	24	GELIGHTING - OL TOP/DBX PRAL S 218 EB EES CWL 835 Louvre (1.000)	1343	2400	36.0
2	56	GELIGHTING - TL 5000 5506/228/16EB T5 CWL GE (1.000)	2834	5280	56.0
3	16	GELIGHTING - TL 5000 5507/254/16EB T5 CWL GE (1.000)	6368	8920	108.0
<b>Total:</b>			<b>292798</b>	<b>496000</b>	<b>5728.0</b>

Specific connected load: 8.80 W/m<sup>2</sup> = 1.81 W/m<sup>2</sup>/100 lx (Ground area: 651.00 m<sup>2</sup>)



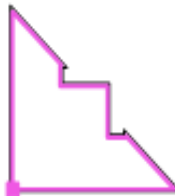
Operator  
Telephone  
Fax  
e-Mail

**Room 3 / Light scene 43 / Workplane / Isolines (E)**



Values in Lux, Scale 1 : 282

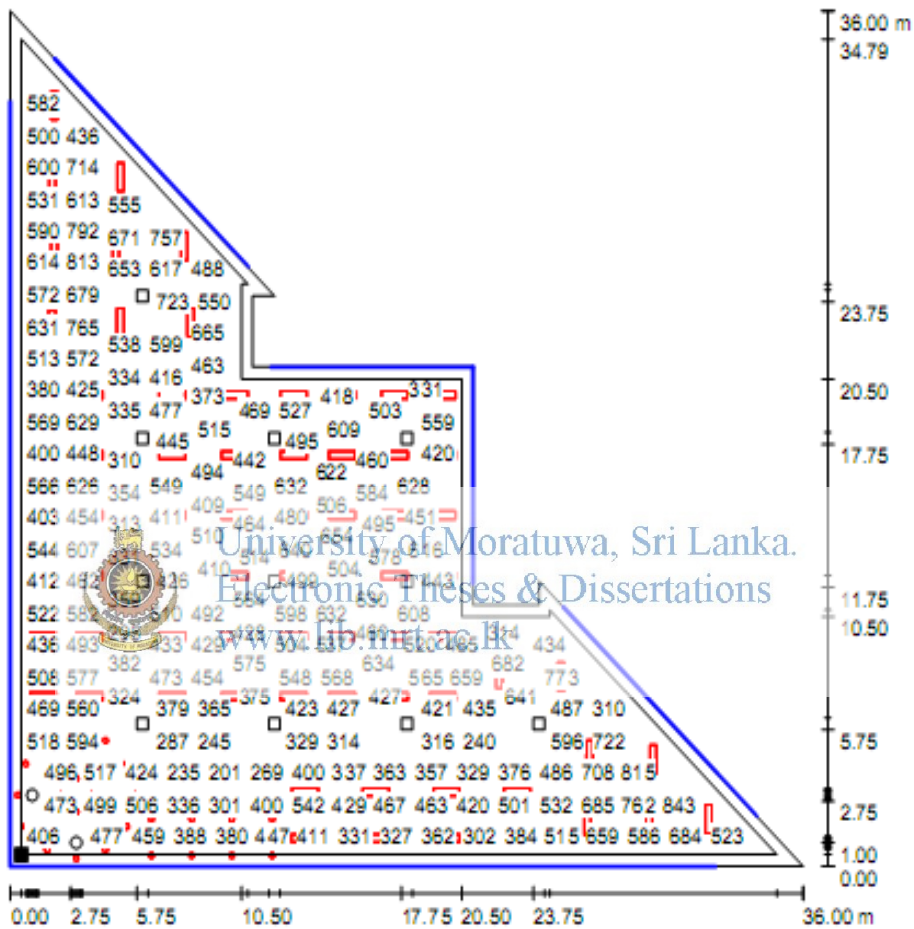
Position of surface in room:  
Working plane with 0.500 m  
Boundary Zone  
Marked point:  
(0.500 m, 0.500 m, 0.750 m)



Grid: 128 x 128 Points

$E_{av}$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	u0	$E_{min} / E_{max}$
485	67	905	0.138	0.074

**Room 3 / Light scene 43 / Workplane / Value Chart (E)**



Values in Lux, Scale 1 : 282

Not all calculated values could be displayed.

Position of surface in room:  
Working plane with 0.500 m  
Boundary Zone  
Marked point:  
(0.500 m, 0.500 m, 0.750 m)



Grid: 128 x 128 Points

$E_{av}$ [lx]	$E_{min}$ [lx]	$E_{max}$ [lx]	u0	$E_{min} / E_{max}$
485	67	905	0.138	0.074

Appendix E – Calculations of cooling load by Loadsoft 6.0 software



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Appendix F Main units of AFHQ Central AC system



CTs



COMPRESSORS



CHILLED WATER PIPING



CHILLER



AHU MAIN DUCT



DIFFUSERS

Figure F.1