



APPENDIX C BREATH CALCULATIONS





APPENDIX C

Cost Analysis

Gravity Column Design Take-Off							
I-Section Size	Linear Footage (in feet)	Bare Cost				Total Incl O&P	Actual Total
		Material	Labor	Equipment	Total		
W 10x33	84.0	34.50	2.02	1.32	37.84	42.50	3,570.00
W 12x40	644.0	42.00	2.08	1.36	45.44	51.00	32,844.00
W 12x45	70.0	47.00	2.11	1.38	50.49	56.50	3,955.00
W 12x50	322.0	52.50	2.11	1.38	55.99	62.50	20,125.00
W 12x53	210.0	55.50	2.11	1.38	58.99	66.00	13,860.00
W 12x58	210.0	61.50	2.11	1.38	64.99	72.50	15,225.00
W 12x65	476.0	68.00	2.16	1.41	71.57	80.00	38,080.00
W 12x72	126.0	75.00	2.16	1.41	78.57	87.75	11,056.50
W 12x79	56.0	82.68	2.21	1.45	86.34	96.50	5,404.00
W 12x87	336.0	91.00	2.21	1.45	94.66	105.00	35,280.00
W 12x96	154.0	100.00	2.21	1.45	103.66	116.00	17,864.00
W 12x106	56.0	110.77	2.27	1.49	114.53	128.00	7,168.00
W 12x120	378.0	125.17	2.27	1.49	128.93	144.00	54,432.00
W 12x136	84.0	142.00	2.33	1.52	145.85	163.00	13,692.00
W 12x152	224.0	159.09	2.33	1.52	162.94	182.00	40,768.00
W 12x170	28.0	177.91	2.39	1.56	181.86	203.50	5,698.00
W 12x190	56.0	199.00	2.39	1.56	202.95	224.00	12,544.00
W 12x210	28.0	219.50	2.39	1.56	223.45	247.00	6,916.00
Total	3542.0						\$338,481.50

Frame Columns Design Take-Off							
I-Section Size	Linear Footage (in feet)	Bare Cost				Total Incl O&P	Actual Total
		Material	Labor	Equipment	Total		
W 12x50	364.0	52.50	2.11	1.38	55.99	62.50	22,750.00
W 12x58	28.0	61.50	2.11	1.38	64.99	72.50	2,030.00
W 12x72	14.0	75.00	2.16	1.41	78.57	87.75	1,228.50
W 12x79	140.0	82.68	2.21	1.45	86.34	96.50	13,510.00
W 12x87	266.0	91.00	2.21	1.45	94.66	105.00	27,930.00
W 12x96	126.0	100.00	2.21	1.45	103.66	116.00	14,616.00
W 12x106	112.0	110.77	2.27	1.49	114.53	128.00	14,336.00
W 12x120	56.0	125.17	2.27	1.49	128.93	144.00	8,064.00
W 12x136	224.0	142.00	2.33	1.52	145.85	163.00	36,512.00
W 12x152	84.0	159.09	2.33	1.52	162.94	182.00	15,288.00
W 12x170	70.0	177.91	2.39	1.56	181.86	203.50	14,245.00
W 12x190	84.0	199.00	2.39	1.56	202.95	224.00	18,816.00
W 12x210	70.0	219.44	2.45	1.61	223.5	247.00	17,290.00
Total	1638.0						\$206,615.50

Frame Beams Design Take-Off							
I-Section Size	Linear Footage (in feet)	Bare Cost				Total Incl O&P	Actual Total
		Material	Labor	Equipment	Total		
W 18x35	1007.1	36.50	3.28	1.58	41.36	47.50	47,837.25
W 24x55	148.5	57.50	2.84	1.37	61.71	69.50	10,320.75
W 30x99	322.5	103.00	2.63	1.26	106.89	120.00	38,700.00
Total	1478.1						\$96,858.00



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Frame Braces Design Take-Off							
Tube Size	Linear Footage (in feet)	Bare Cost				Total Incl O&P	Actual Total
		Material	Labor	Equipment	Total		
HSS 6x6x.5	201.9	21.42	2.58	1.74	27.00	32.00	6,460.80
HSS 7x7x.5	689.9	29.03	2.63	1.76	35.89	42.50	29,320.75
HSS 8x8x.5	558.9	36.64	2.71	1.78	44.78	51.25	28,643.63
HSS 9x9x.5	85	50.35	2.78	1.8	54.93	64.00	5,440.00
HSS 10x10x.5	778.9	64.06	2.84	1.84	68.74	77.00	59,975.30
HSS 12x12x.5	453.2	77.77	2.89	1.87	82.53	93.00	42,147.60
Total	2767.8						\$171,988.08

Total Structure Gravity Beam Takeoff							
I-Section Size	Linear Footage (in feet)	Bare Cost				Total Incl O&P	Actual Total
		Material	Labor	Equipment	Total		
W 8x10	46.3	10.45	3.63	2.38	16.46	20.50	949.15
W 8x18	25.7	18.85	3.63	2.38	24.86	31.00	795.77
W 10x12	787.6	12.55	3.63	2.38	18.56	22.50	17,720.78
W 10x22	96.0	23.00	3.63	2.38	29.01	34.50	3,312.00
W 12x16	3365.2	16.50	2.48	1.62	20.60	24.00	80,763.84
W 12x26	460.7	27.00	2.48	1.62	31.10	36.00	16,584.12
W 12x58	207.5	60.75	3.26	2.17	66.18	73.50	15,254.19
W 14x22	1461.5	23.00	2.2	1.44	26.64	32.00	46,769.28
W 16x26	10984.2	27.00	2.18	1.43	30.61	35.50	389,940.52
W 16x31	115.3	32.50	2.42	1.59	36.51	41.50	4,785.78
W 16x36	1242.0	37.50	2.52	1.68	41.70	50.00	62,100.00
W 16x67	58.0	70.00	2.83	1.58	74.41	84.00	4,872.00
W 18x35	2047.2	36.50	3.28	1.58	41.36	47.50	97,242.00
W 18x40	685.3	42.00	3.28	1.58	46.86	53.50	36,665.69
W 21x50	119.4	52.50	2.82	1.46	56.78	64.50	7,699.37
W 24x55	2405.0	57.50	2.84	1.37	61.71	70.00	168,346.50
W 24x62	3239.7	65.00	2.84	1.37	69.21	78.00	252,694.26
W 24x68	645.0	71.00	2.84	1.37	75.21	84.50	54,502.50
W 24x76	495.0	79.50	2.84	1.37	83.71	94.00	46,530.00
W 24x84	1050.0	88.00	2.92	1.40	92.32	103.00	108,150.00
W 24x94	1140.0	98.00	2.92	1.40	102.32	115.00	131,100.00
W 24x103	60.0	107.00	2.92	1.40	111.32	127.00	7,620.00
W 27x94	420.2	98.00	2.65	1.27	101.92	114.00	47,899.38
W 30x90	908.6	94.00	2.63	1.26	97.89	112.50	102,213.00
W 30x99	240.0	103.00	2.63	1.26	106.89	120.00	28,794.00
W 30x108	333.1	113.00	2.63	1.32	116.95	130.00	43,305.60
W 30x118	911.3	123.00	2.72	1.31	127.03	141.00	128,497.53
Total	33549.7						1,905,107.25

Total Structure Shear Studs								
Level	Shear Studs	# of studs (To the nearest 100)	Bare Cost				Total Incl O&P	Actual Total
			Material	Labor	Equipment	Total		
Roof	3/4 dia. - 3" long	2238	0.41	0.68	0.28	1.37	2.000	4,476.00
9th Floor	3/4 dia. - 4" long	2511	0.50	0.70	0.29	1.49	2.080	5,222.88
8th Floor	3/4 dia. - 4" long	2511	0.50	0.70	0.29	1.49	2.080	5,222.88
7th Floor	3/4 dia. - 4" long	2511	0.50	0.70	0.29	1.49	2.080	5,222.88
6th Floor	3/4 dia. - 4" long	2511	0.50	0.70	0.29	1.49	2.080	5,222.88
5th Floor	3/4 dia. - 4" long	2511	0.50	0.70	0.29	1.49	2.080	5,222.88
4th Floor	3/4 dia. - 4" long	2511	0.50	0.70	0.29	1.49	2.080	5,222.88
3rd Floor	3/4 dia. - 4" long	2511	0.50	0.70	0.29	1.49	2.080	5,222.88
2nd Floor	3/4 dia. - 4" long	2511	0.50	0.70	0.29	1.49	2.080	5,222.88
Total		22326						\$46,259.04



APPENDIX C

Total Structure Metal Decking							
Level	Area (square feet)	Bare Cost				Total Incl O&P	Actual Total
		Material	Labor	Equipment	Total		
Roof	19433	5.11	0.91	0.06	6.08	6.76	131,367.08
9th Floor	19433	5.11	0.91	0.06	6.08	6.76	131,367.08
8th Floor	19433	5.11	0.91	0.06	6.08	6.76	131,367.08
7th Floor	19433	5.11	0.91	0.06	6.08	6.76	131,367.08
6th Floor	19433	5.11	0.91	0.06	6.08	6.76	131,367.08
5th Floor	19433	5.11	0.91	0.06	6.08	6.76	131,367.08
4th Floor	19433	5.11	0.91	0.06	6.08	6.76	131,367.08
3rd Floor	19433	5.11	0.91	0.06	6.08	6.76	131,367.08
2nd Floor	21315	5.11	0.91	0.06	6.08	6.76	144,089.40
Total	176779						\$1,195,026.04

Addition Welded Wire Fabric (6x6-W2.9 x W2.9)							
Level	Area ** (square feet)	Bare Cost				Total Incl O&P	Actual Total
		Material	Labor	Equipment	Total		
Roof	21,376	17.15	22.00	0	39.15	55.00	11,756.97
9th Floor	21,376	17.15	22.00	0	39.15	55.00	11,756.97
8th Floor	21,376	17.15	22.00	0	39.15	55.00	11,756.97
7th Floor	21,376	17.15	22.00	0	39.15	55.00	11,756.97
6th Floor	21,376	17.15	22.00	0	39.15	55.00	11,756.97
Total	106,882						\$58,784.83

** 10% Adjustment Added for Overlapping

Addition Slab on Metal Deck							
Level	Area ** (square feet)	Bare Cost				Total Incl O&P	Actual Total
		Material	Labor	Equipment	Total		
Roof	21,376	1.32	0.67	0.27	2.26	2.83	60,494.93
9th Floor	21,376	1.32	0.67	0.27	2.26	2.83	60,494.93
8th Floor	21,376	1.32	0.67	0.27	2.26	2.83	60,494.93
7th Floor	21,376	1.32	0.67	0.27	2.26	2.83	60,494.93
6th Floor	21,376	1.32	0.67	0.27	2.26	2.83	60,494.93
Total	106,882						\$302,474.65

** 7% Adjustment Added for Spillage and Shrinkage

Addition Concrete Slab Edge Formwork							
Level	Perimeter (linear feet)	Bare Cost				Total Incl O&P	Actual Total
		Material	Labor	Equipment	Total		
Roof	626	14.60	11.90	0	26.50	36.00	22,536.00
9th Floor	626	14.60	11.90	0	26.50	36.00	22,536.00
8th Floor	626	14.60	11.90	0	26.50	36.00	22,536.00
7th Floor	626	14.60	11.90	0	26.50	36.00	22,536.00
6th Floor	626	14.60	11.90	0	26.50	36.00	22,536.00
Total	3,130						\$112,680.00



APPENDIX C

Time Schedule

ADDITION	
Concrete	
Placing Slab Reinforcement	
6th Floor	4 days
7th Floor	4 days
8th Floor	4 days
9th Floor	4 days
Roof	4 days
	20 days
Placing Slab Edge	
6th Floor	4 days
7th Floor	4 days
8th Floor	4 days
9th Floor	4 days
Roof	4 days
	20 days
Pouring Slab on Metal Deck	
6th Floor	4 days
7th Floor	4 days
8th Floor	4 days
9th Floor	4 days
Roof	4 days
	20 days
Concrete Total	
	60 days
Structural Steel	
Steel Column Erection	
6th - 8th Floor	6 days
9th - Roof	4 days
	10 days
Steel Floor Frame Erection	
6th Floor	4 days
7th Floor	4 days
8th Floor	4 days
9th Floor	4 days
Roof	4 days
	20 days
Install Metal Deck	
6th Floor	5 days
7th Floor	5 days
8th Floor	5 days
9th Floor	5 days
Roof	5 days
	25 days
Install Shear Studs	
6th Floor	3 days
7th Floor	3 days
8th Floor	3 days
9th Floor	3 days
Roof	3 days
	15 days
Structural Steel Total	
	70 days

PHASE ONE	
Concrete	
Slab on Metal Deck (2nd Floor)	8 days
Slab on Metal Deck (3rd Floor)	8 days
Slab on Metal Deck (4th Floor)	8 days
Slab on Metal Deck (Roof)	8 days
	32 days
Structural Steel	
Steel Erection	45 days
Install Metal Deck	15 days
	60 days



APPENDIX C

Gravity Column Design Take-Off				
I-Section Size	Linear Footage (in feet)	Labor Hours		
		(L.F per day)	Crew	Days
W 10x33	84.0	1032	E-2	0.081
W 12x40	644.0	1032	E-2	0.624
W 12x45	70.0	1032	E-2	0.068
W 12x50	322.0	1032	E-2	0.312
W 12x53	210.0	1032	E-2	0.203
W 12x58	210.0	1032	E-2	0.203
W 12x65	476.0	984	E-2	0.484
W 12x72	126.0	984	E-2	0.128
W 12x79	56.0	984	E-2	0.057
W 12x87	336.0	984	E-2	0.341
W 12x96	154.0	984	E-2	0.157
W 12x106	56.0	960	E-2	0.058
W 12x120	378.0	960	E-2	0.394
W 12x136	84.0	960	E-2	0.088
W 12x152	224.0	912	E-2	0.246
W 12x170	28.0	912	E-2	0.031
W 12x190	56.0	912	E-2	0.061
W 12x210	28.0	912	E-2	0.031
Total	3542.0			3.567

Frame Column Design Take-Off				
I-Section Size	Linear Footage (in feet)	Labor Hours		
		(L.F per day)	Crew	Days
W 12x50	364.0	1032	E-2	0.353
W 12x58	28.0	1032	E-2	0.027
W 12x72	14.0	984	E-2	0.014
W 12x79	140.0	984	E-2	0.142
W 12x87	266.0	984	E-2	0.270
W 12x96	126.0	984	E-2	0.128
W 12x106	112.0	960	E-2	0.117
W 12x120	56.0	960	E-2	0.058
W 12x136	224.0	960	E-2	0.233
W 12x152	84.0	912	E-2	0.092
W 12x170	70.0	912	E-2	0.077
W 12x190	84.0	912	E-2	0.092
W 12x210	70.0	912	E-2	0.077
Total	1638.0			1.681

Frame Braces Design Take-Off				
Tube Size	Linear Footage (in feet)	Labor Hours		
		(L.F per day)	Crew	Days
HSS 6x6x.5	201.9	648	E-2	0.312
HSS 7x7x.5	689.9	624	E-2	1.106
HSS 8x8x.5	558.9	600	E-2	0.932
HSS 9x9x.5	85	576	E-2	0.148
HSS 10x10x.5	778.9	576	E-2	1.352
HSS 12x12x.5	453.2	552	E-2	0.821
Total	2767.8			4.670

Total Time	9.917
Total Schedule Time Alloted for Column/Brace Erection	10 days



APPENDIX C

Typical Floor Gravity Beam Takeoff				
I-Section Size	Linear Footage (in feet)	Labor Hours		
		(L.F. per day)	Crew	Days
W 10x12	93.8	600	E-2	0.156
W 10x22	12.0	600	E-2	0.020
W 12x16	310.5	880	E-2	0.353
W 12x26	65.8	880	E-2	0.075
W 12x58	29.7	750	E-2	0.040
W 14x22	148.0	990	E-2	0.149
W 16x26	1170.5	1000	E-2	1.170
W 16x36	148.0	900	E-2	0.164
W 18x35	215.9	960	E-2	0.225
W 18x40	73.5	960	E-2	0.077
W 24x55	225.0	1110	E-2	0.203
W 24x62	430.6	1110	E-2	0.388
W 24x68	75.0	1110	E-2	0.068
W 24x76	45.0	1110	E-2	0.041
W 24x84	150.0	1080	E-2	0.139
W 24x94	120.0	1080	E-2	0.111
W 27x84	25.0	1190	E-2	0.021
W 30x90	120.0	1200	E-2	0.100
W 30x99	34.3	1200	E-2	0.029
W 30x108	37.0	1200	E-2	0.031
W 30x118	125.2	1176	E-2	0.106
Total	3654.6			3.665

Roof Gravity Beam Takeoff				
I-Section Size	Linear Footage (in feet)	Labor Hours		
		(L.F. per day)	Crew	Days
W 10x12	82.2	600	E-2	0.137
W 12x14	163.3	600	E-2	0.272
W 12x16	160.6	880	E-2	0.182
W 14x22	140.1	990	E-2	0.142
W 16x26	1408.1	1000	E-2	1.408
W 18x35	254.0	1000	E-2	0.254
W 21x50	89.4	960	E-2	0.093
W 24x55	745.6	1110	E-2	0.672
W 24x62	115.0	1110	E-2	0.104
W 24x76	45.0	1110	E-2	0.041
W 24x84	90.0	1080	E-2	0.083
W 24x94	120.0	1200	E-2	0.100
W 27x84	90.0	1190	E-2	0.076
W 30x90	34.2	1200	E-2	0.029
W 30x108	37.0	1200	E-2	0.031
W 30x118	35.2	1176	E-2	0.030
Total	3609.5			3.652

Typical Floor Metal Decking				
Level	Area (square feet)	Labor Hours		
		(S.F. per day)	Crew	Days
Roof	19433	3900	E-4	4.98
9th Floor	19433	3900	E-4	4.98
8th Floor	19433	3900	E-4	4.98
7th Floor	19433	3900	E-4	4.98
6th Floor	19433	3900	E-4	4.98
Total	97165			24.91

Addition's Shear Studs				
Levels	# of studs	Labor Hours		
		(Studs per day)	Crew	Days
Roof	2238	1030	E-10	2.173
9th Floor	2511	1030	E-10	2.438
8th Floor	2511	1030	E-10	2.438
7th Floor	2511	1030	E-10	2.438
6th Floor	2511	1030	E-10	2.438
Total	12282			11.924



APPENDIX C

Welded Wire Fabric (6x6-W2.9 x W2.9)				
Level	Area (square feet)	Labor Hours		
		(S.F. per day)	Crew	Days
Roof	19433	5800	4 Rodm	3.35
9th Floor	19433	5800	4 Rodm	3.35
8th Floor	19433	5800	4 Rodm	3.35
7th Floor	19433	5800	4 Rodm	3.35
6th Floor	19433	5800	4 Rodm	3.35
Total	97165			16.75

Slab on Metal Decking				
Level	Area (square feet)	Labor Hours		
		(S.F. per day)	Crew	Days
Roof	19433	5226	(2) C-8	3.72
9th Floor	19433	5226	(2) C-8	3.72
8th Floor	19433	5226	(2) C-8	3.72
7th Floor	19433	5226	(2) C-8	3.72
6th Floor	19433	5226	(2) C-8	3.72
Total	97165			18.59

Slab Edge Formwork				
Level	Length (linear feet)	Labor Hours		
		(L.F. per day)	Crew	Days
Roof	626	180	(2) C-1	3.48
9th Floor	626	180	(2) C-1	3.48
8th Floor	626	180	(2) C-1	3.48
7th Floor	626	180	(2) C-1	3.48
6th Floor	626	180	(2) C-1	3.48
Total	3130			17.39



APPENDIX C

Louver Calculations

Air Handling Units on 5th Floor		
Unit	Handles	Dimension
RAHU-1	3rd Floor	12' x 27'
RAHU-2	Ambulatory Surgery	12' x 27'
RAHU-3	Ambulatory Surgery	12' x 27'
RAHU-4	6th Floor	12' x 27'
RAHU-5	7th Floor	12' x 27'

TABLE E-1

ASHRAE Standard 62.1 (Ventilation for Acceptable Indoor Air Quality)		
Application	Max Occupancy Density	Outdoor Air Requirement
	#/1000 ft ²	cmf/person
Medical Procedure	20	15
Operating Rooms	20	30

Each Floor Area is Approximately **20,000 square feet**
Five Air Handling Units located on the 5th Floor (See Above)
- 3rd, 6th, and 7th Floors - Medical Procedure Floors
- 4th Floor - Operating Room (2 units)

Required CFM Calculations

Medical Procedure Floors

= (20 people/1000 ft²)(20,000 ft²) = 400 people
 = (400 people)(15 cmf/person) = 6000 cmf
 = (6000 cmf per floor)(3 floors) = **18,000 cmf**

Operating Room Floor

= (20 people/1000 ft²)(20,000 ft²) = 400 people
 = (400 people)(30 cmf/person) = **12000 cmf**

Total Required cmf = 30,000 cmf

Convert Values to Area of Louver needed (ft²)

Wind Velocity = 4.9 mph ----> convert to ft/min = **431.2 ft/min**
 cmf/(ft/min) = ft² ----> gives area
 = (30,000 cmf)/(431.2 ft/min) = **69.57 ft²**
 - Multiply Area by 1.43, assume that louver only provides 70% free area
 (1.43)*(69.57 ft²) = **100 ft²** per wall

- Also take into account louver size needed for maintenance/ repair
 - Increase louver size to 15' x 10' , therefore **150 ft²** per wall

RETScreen® Energy Model - Wind Energy Project

Units:

Site Conditions		Estimate	Notes/Range
Project name		MSK	
Project location		North Jersey	
Wind data source		Wind speed	
Nearest location		New York City, NY	
Annual wind power density	W/m ²	362	
Height of wind power density	ft	50.0	
Annual average wind speed	mph	5.4	
Height of wind measurement	ft	60.0	3.0 to 100.0 m
Wind shear exponent	-	0.16	0.10 to 0.40
Wind speed	mph	4.9	
Average atmospheric pressure	psi	101.6	60.0 to 103.0 kPa
Annual average temperature	°F	12	-20 to 30 °C



APPENDIX C

Required Transmission Loss for 6th Floor Private Offices

Sound Absorption coefficients for source and receiver rooms								
Frequency	Mechanical Room				Private Offices			Source
Hz	Walls (α)	Floor (α)	Ceiling (α)	Louver (α)	Walls (α)	Floor (α)	Ceiling (α)	Lw
125	0.36	0.01	0.01	1.00	0.55	0.02	0.76	89
250	0.44	0.01	0.01	1.00	0.14	0.06	0.93	88
500	0.31	0.02	0.02	1.00	0.08	0.14	0.83	89
1000	0.29	0.02	0.02	1.00	0.04	0.37	0.99	86
2000	0.39	0.02	0.02	1.00	0.05	0.60	0.99	82
4000	0.25	0.02	0.02	1.00	0.11	0.65	0.94	77

Frequency	α sab (avg)	$S\alpha$	RTs	α sab (avg)	$S\alpha$	RTr	RC-30 Lp	Source Lp	NR	TL	Adj TL
125	0.0817	362.56	394.81	0.4762	57.434	109.66	45	69.04	24	18.1	23.08
250	0.0954	423.52	468.20	0.3037	36.622	52.59	40	67.30	27	24.5	29.53
500	0.0813	360.70	392.61	0.2667	32.166	43.87	35	69.06	34	32.1	37.08
1000	0.0778	345.46	374.62	0.3351	40.408	60.77	30	66.26	36	32.9	37.87
2000	0.0950	421.66	465.93	0.3935	47.452	78.23	25	61.32	36	31.8	36.82
4000	0.0710	314.98	339.04	0.4258	51.352	89.43	20	57.70	38	32.6	37.62

Source				Receiver			
A (walls)	A (floor)	A (ceiling)	A (louver)	A (walls)	A (floor)	A (ceiling)	A (partition)
762	1812	1812	52	65	27.8	27.8	27.8

Mechanical Room
Floor: Concrete
Ceiling: Concrete
Walls: Coarse Concrete Block

Operating Room
Floor: Heavy Carpet
Ceiling: 3/4" thick acoustical board
Walls: Gypsum board

Transmission Loss from Partition			
(4.5" Reinforced Concrete Slab)			
Frequency	TL (dB)	Rq'd TL	Addition TL needed?
125 Hz	48	23.08	NO
250 Hz	42	29.53	NO
500 Hz	45	37.08	NO
1000 Hz	56	37.87	NO
2000 Hz	57	36.82	NO
4000 Hz	66	37.62	NO



APPENDIX C

Required Transmission Loss for 4th Floor Operating Rooms

Sound Absorption coefficients for source and receiver rooms								
Frequency	Mechanical Room				O.R.			Source
	Walls (α)	Floor (α)	Ceiling (α)	Louver (α)	Walls (α)	Floor (α)	Ceiling (α)	
125	0.36	0.01	0.01	1.00	0.55	0.02	0.76	89
250	0.44	0.01	0.01	1.00	0.14	0.03	0.93	88
500	0.31	0.02	0.02	1.00	0.08	0.03	0.83	89
1000	0.29	0.02	0.02	1.00	0.04	0.03	0.99	86
2000	0.39	0.02	0.02	1.00	0.05	0.03	0.99	82
4000	0.25	0.02	0.02	1.00	0.11	0.02	0.94	77

Frequency	α sab (avg)	Sa	RTs	α sab (avg)	Sa	RTr	RC-25 Lp	Source Lp	NR	TL	Adj TL
125	0.0817	362.56	394.81	0.4614	77.52	143.94	40	69.04	29	24.1	29.13
250	0.0954	423.52	468.20	0.3282	55.14	82.08	35	67.30	32	29.8	34.83
500	0.0813	360.70	392.61	0.2738	45.99	63.33	30	69.06	39	37.7	42.72
1000	0.0778	345.46	374.62	0.3002	50.43	72.06	25	66.26	41	39.4	44.36
2000	0.0950	421.66	465.93	0.3046	51.18	73.60	20	61.32	41	39.3	44.32
4000	0.0710	314.98	339.04	0.3148	52.89	77.19	15	57.70	43	40.5	45.50

Source				Receiver			
A (walls)	A (floor)	A (ceiling)	A (louver)	A (walls)	A (floor)	A (ceiling)	A (partition)
762	1812	1812	52	75	46.5	46.5	46.5

Mechanical Room
Floor: Concrete
Ceiling: Concrete
Walls: Coarse Concrete Block

Operating Room
Floor: Linoleum
Ceiling: 3/4" thick acoustical board
Walls: Gypsum board

Transmission Loss from Partition			
(4.5" Reinforced Concrete Slab)			
Frequency	TL (dB)	Rq'd TL	Addition TL needed?
125 Hz	48	29.13	NO
250 Hz	42	34.83	NO
500 Hz	45	42.72	NO
1000 Hz	56	44.36	NO
2000 Hz	57	44.32	NO
4000 Hz	66	45.50	NO