

## Appendix A: Trace Outputs

### Air Handling Unit 2 System Output

#### Proscenium Theater Loads

- Zone 1 – First level not under the balcony
- Zone 2 – First level under the balcony
- Zone 3 – Balcony
- Zone 4 – Plenum of the Proscenium Theater
- Orchestra Pit

# System Checksums

By ae

## AHU-2

Single Zone

COOLING COIL PEAK			CLG SPACE PEAK			HEATING COIL PEAK			TEMPERATURES		
Peaked at Time: Mo/Hr: 7 / 15			Mo/Hr: 7 / 16			Mo/Hr: 13 / 1					
Outside Air: OADB/WB/HR: 89 / 74 / 102			OADB: 89			OADB: 14					
Space Sens. + Lat. Btu/h	Plenum Sens. + Lat. Btu/h	Net Total Btu/h	Space Sensible Btu/h	Percent Of Total (%)	Space Sens Btu/h	Coil Peak Tot Btu/h	Percent Of Total (%)	SADB Cooling 68.0	Plenum Heating 75.0	Return Cooling 78.7	Return Heating 66.6
<b>Envelope Loads</b>											
0	0	0	0	0.00	0	0	0.00	0	0.00	0	0.00
0	0	0	0	0.00	0	0	0.00	0	0.00	0	0.00
0	24,095	24,095	0	3.82	0	-22,384	8.44	0	68.0	0	58.0
0	0	0	0	0.00	0	0	0.00	0	0.1	0	0.0
0	0	0	0	0.00	0	0	0.00	0	0.3	0	0.0
0	0	0	0	0.00	0	0	0.00	0	0.9	0	0.0
1,722	0	1,722	1,855	0.27	0	0	0.00	-2,168	0.82	0	0.00
0	0	0	0	0.00	0	-2,168	0.82	-5,670	2.14	0	0.00
0	0	0	0	0.00	0	0	0.00	0	0.00	0	0.00
1,722	24,095	25,817	1,855	4.09	-7,838	-30,222	11.40	-7,838	11.40	0	0.00
<b>Internal Loads</b>											
24,154	26,662	50,815	24,154	8.05	0	0	0.00	0	0.00	0	0.00
143,890	0	143,890	84,940	22.80	0	0	0.00	0	0.00	0	0.00
4,915	0	4,915	4,915	0.78	0	0	0.00	0	0.00	0	0.00
172,958	26,662	199,620	114,008	31.63	0	0	0.00	0	0.00	0	0.00
<b>Sub Total ==&gt;</b>											
-2,895	2,895	0	-2,348	-2.07	-1,205	0	0.00	-1,205	0.00	0	0.00
0	0	110,088	0	0.00	0	-138,181	52.13	0	52.13	0	0.00
0	-3,409	-3,409	0	0.00	-100,148	-100,148	37.78	-100,148	37.78	0	0.00
20,780	20,780	41,560	0	-0.54	0	3,474	-1.31	0	-1.31	0	0.00
20,780	0	20,780	20,780	3.29	0	0	0.00	0	0.00	0	0.00
0	0	257,377	0	0.00	0	0	0.00	0	0.00	0	0.00
<b>Grand Total ==&gt;</b>											
171,786	71,022	631,054	113,515	100.00	-109,190	-265,076	100.00	-109,190	100.00	502	-33.09
<b>ENGINEERING CKS</b>											
<b>Cooling Heating</b>											
% OA 16.4 16.4											
cfm/ft² 1.87 1.87											
cfm/ton 533.45 533.45											
ft²/ton 285.24 285.24											
Btu/hr-ft² 42.07 42.07											
No. People 502 502											
<b>HEATING COIL SELECTION</b>											
Capacity MBh -248.2 14,027 59.1 75.0											
Coil Airflow cfm 14,027 14,027 59.1 75.0											
Lvg °F 59.1 75.0											
Main Htg 0.0 0.0 0.0 0.0											
Aux Htg 0.0 0.0 0.0 0.0											
Preheat 0.0 0.0 0.0 0.0											
Humidif 0.0 0.0 0.0 0.0											
Opt Vent 0.0 0.0 0.0 0.0											
Total -248.2 -248.2											
<b>AREAS</b>											
Gross Total 7,500 1,863 150 6,043											
Glass ft² 0 0 0 0											
Floor 7,500											
Part 1,863											
ExFir 150											
Roof 6,043											
Wall 0											
<b>COOLING COIL SELECTION</b>											
Total Capacity ton 26.3 315.5											
Sens Cap. MBh 248.9 14,027 81.5 64.6											
Coil Airflow cfm 14,027 14,027 81.5 64.6											
Enter DB/WB/HR °F 81.5 64.6 64.4 50.2											
Leave DB/WB/HR °F 50.2 50.1 53.9 50.0											
Main Clg 0.0 0.0 0.0 0.0											
Aux Clg 0.0 0.0 0.0 0.0											
Opt Vent 0.0 0.0 0.0 0.0											
Total 26.3 315.5											

# Room Checksums

By ae

## Zone 1 Theater seating UFAD

COOLING COIL PEAK		CLG SPACE PEAK		HEATING COIL PEAK		TEMPERATURES	
Peaked at Time: Mo/Hr: 7 / 15		Mo/Hr: 7 / 16		Mo/Hr: 13 / 1			
Outside Air: OADB/WB/HR: 89 / 74 / 102		OADB: 89		OADB: 14			
Space Sens. + Lat. Btu/h	Plenum Sens. + Lat. Btu/h	Net Total Btu/h	Percent Sensible Of Total (%)	Space Peak Btu/h	Coil Peak Tot Btu/h	Percent Of Total (%)	
<b>Envelope Loads</b>							
0	0	0	0.00	0	0	0.00	SADB Cooling 68.0
0	0	0	0.00	0	0	0.00	Plenum Heating 75.0
0	0	0	0.00	0	0	0.00	Return 76.3
0	0	0	0.00	0	0	0.00	Ret/OA 78.5
0	0	0	0.00	0	0	0.00	Fn MtrTD 0.1
0	0	0	0.00	0	0	0.00	Fn BidTD 0.3
0	0	0	0.00	0	0	0.00	Fn Frict 0.9
1,132	1,132	1,132	2.93	-745	-745	0.79	
0	0	0	0.00	-5,670	-5,670	6.00	
0	0	0	0.00	0	0	0.00	
1,132	1,132	1,132	2.93	-6,415	-6,415	6.79	
<b>Internal Loads</b>							
7,236	0	7,236	17.72	0	0	0.00	Vent Cooling 893
53,400	0	53,400	79.35	0	0	0.00	Infil Heating 893
0	0	0	0.00	0	0	0.00	Supply 5,245
60,636	0	60,636	97.07	0	0	0.00	MinStop/Rh 0
<b>Internal Loads</b>							
0	0	0	0.00	0	0	0.00	Return 5,245
0	0	43,073	20.01	0	0	0.00	Exhaust 893
0	0	0	0.00	-34,418	-34,418	36.44	Rm Exh 0
-1,323	-1,323	-1,323	-0.61	0	0	0.00	Auxil 0
7,771	7,771	7,771	3.61	0	0	0.00	
7,771	7,771	7,771	3.61	0	0	0.00	
0	0	96,248	44.70	0	0	0.00	
<b>Grand Total ==&gt;</b>							
61,767	6,448	215,308	100.00	-40,832	-94,459	100.00	
<b>ENGINEERING CKS</b>							
<b>Cooling</b>							
<b>Heating</b>							
% OA	17.0	17.0					
cfm/ft²	3.09	3.09					
cfm/ton	584.69	584.69					
ft²/ton	189.50	189.50					
Btu/hr-ft²	63.33	63.33					-55.56
No. People	200	200					
<b>AREAS</b>							
<b>Gross Total</b>							
<b>HEATING COIL SELECTION</b>							
Capacity MBh							
Coil Airflow cfm							
Ent °F							
Lvg °F							
Main Ctg	9.0	107.7	82.6	5,245	5,245	58.8	75.0
Aux Ctg	0.0	0.0	0.0	0	0	0.0	0.0
Opt Vent	0.0	0.0	0.0	0	0	0.0	0.0
<b>Total</b>							
9.0	107.7	82.6	5,245	5,245	58.8	75.0	75.0
<b>COOLING COIL SELECTION</b>							
Total Capacity ton							
Sens Cap. MBh							
Coil Airflow cfm							
Enter DB/°F							
Leave DB/°F							
Enter WB/°F							
Leave WB/°F							
Enter DB/WB/HR							
Leave DB/WB/HR							
Enter DB/°F							
Leave DB/°F							
Enter WB/°F							
Leave WB/°F							
Enter DB/WB/HR							
Leave DB/WB/HR							
<b>Total</b>							
9.0	107.7	82.6	5,245	5,245	58.8	75.0	75.0
<b>HEATING COIL SELECTION</b>							
Capacity MBh							
Coil Airflow cfm							
Ent °F							
Lvg °F							
Main Htg	9.0	107.7	82.6	5,245	5,245	58.8	75.0
Aux Htg	0.0	0.0	0.0	0	0	0.0	0.0
Preheat	0.0	0.0	0.0	0	0	0.0	0.0
<b>Total</b>							
9.0	107.7	82.6	5,245	5,245	58.8	75.0	75.0

# Room Checksums

By ae

## Zone 2 UFAD Theater

COOLING COIL PEAK		CLG SPACE PEAK		HEATING COIL PEAK		TEMPERATURES	
Peaked at Time: Mo/Hr: 7 / 15		Mo/Hr: 7 / 16		Mo/Hr: 13 / 1			
Outside Air: OADB/WB/HR: 89 / 74 / 102		OADB: 89		OADB: 14			
Space Sens. + Lat. Btu/h	Plenum Sens. + Lat. Btu/h	Net Total Btu/h	Percent Sensible Of Total (%)	Space Peak Btu/h	Coil Peak Tot Btu/h	Percent Of Total (%)	
<b>Envelope Loads</b>							
SkyLite Solar	0	0	0.00	0	0	0.00	SADB Cooling 68.0
SkyLite Cond	0	0	0.00	0	0	0.00	Plenum Heating 75.0
Roof Cond	0	0	0.00	0	0	0.00	Return 76.3
Glass Solar	0	0	0.00	0	0	0.00	Ret/OA 78.2
Glass Cond	0	0	0.00	0	0	0.00	Fn MtrTD 0.1
Wall Cond	0	0	0.00	0	0	0.00	Fn BidTD 0.3
Partition	644	644	2.93	-424	-424	0.86	Fn Frict 0.9
Exposed Floor	0	0	0.00	0	0	0.00	
Infiltration	0	0	0.00	0	0	0.00	
<b>Sub Total ==&gt;</b>	<b>644</b>	<b>644</b>	<b>2.93</b>	<b>-424</b>	<b>-424</b>	<b>0.86</b>	
<b>Internal Loads</b>							
Lights	8,027	8,027	34.47	0	0	0.00	Vent Cooling 430
People	24,030	24,030	62.61	0	0	0.00	Infil Heating 430
Misc	0	0	0.00	0	0	0.00	Supply 2,992
<b>Sub Total ==&gt;</b>	<b>32,057</b>	<b>32,057</b>	<b>27.38</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	MinStop/Rh 0
<b>Engineering CKS</b>							
Ceiling Load	0	0	0.00	0	0	0.00	Return 2,992
Ventilation Load	0	0	0.00	0	0	0.00	Exhaust 430
Ov/Undr Sizing	0	21,246	18.15	-22,865	-22,865	46.56	Rm Exh 0
Exhaust Heat	-637	-637	-0.54	0	0	0.00	Auxil 0
Sup. Fan Heat	4,432	4,432	3.79	0	0	0.00	
Ret. Fan Heat	4,432	4,432	3.79	0	0	0.00	
Duct Heat PkUp	0	54,895	46.89	0	0	0.00	
Reheat at Design	0	0	0.00	0	0	0.00	
<b>Grand Total ==&gt;</b>	<b>32,702</b>	<b>117,069</b>	<b>100.00</b>	<b>-23,289</b>	<b>-49,111</b>	<b>100.00</b>	
<b>COOLING COIL SELECTION</b>							
Total Capacity ton	4.9	58.5	46.5	2,992	60.2	75.0	
Main Clg	4.9	58.5	46.5	2,992	60.2	75.0	
Aux Clg	0.0	0.0	0.0	0	0	0.0	
Opt Vent	0.0	0.0	0.0	0	0	0.0	
<b>Total</b>	<b>4.9</b>	<b>58.5</b>	<b>46.5</b>	<b>2,992</b>	<b>60.2</b>	<b>75.0</b>	
<b>HEATING COIL SELECTION</b>							
Total Capacity ton	0.0	0.0	0.0	0	0	0.0	
Main Htg	0.0	0.0	0.0	0	0	0.0	
Aux Htg	0.0	0.0	0.0	0	0	0.0	
Preheat	0.0	0.0	0.0	0	0	0.0	
<b>Total</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>	
<b>AREAS</b>							
Gross Total	1,100	364	0	0	0	0	
Floor	1,100	364	0	0	0	0	
Part	0	0	0	0	0	0	
ExFir	0	0	0	0	0	0	
Roof	0	0	0	0	0	0	
Wall	0	0	0	0	0	0	
<b>HEATING COIL SELECTION</b>							
Capacity MBh	-49.1	2,992	60.2	75.0			
Main Htg	-49.1	2,992	60.2	75.0			
Aux Htg	0.0	0	0	0			
Preheat	0.0	0	0	0			
<b>Total</b>	<b>-49.1</b>	<b>2,992</b>	<b>60.2</b>	<b>75.0</b>			
<b>TEMPERATURES</b>							
SADB	68.0	75.0	68.0				
Plenum	75.0	68.0	68.0				
Return	76.3	68.0	68.0				
Ret/OA	78.2	60.2	60.2				
Fn MtrTD	0.1	0.0	0.0				
Fn BidTD	0.3	0.0	0.0				
Fn Frict	0.9	0.0	0.0				
<b>AIRFLOWS</b>							
Vent	430	430	0				
Infil	0	0	0				
Supply	2,992	2,992	0				
MinStop/Rh	0	0	0				
Return	2,992	2,992	0				
Exhaust	430	430	0				
Rm Exh	0	0	0				
Auxil	0	0	0				
<b>ENGINEERING CKS</b>							
% OA	14.4	14.4	0				
cfm/ft²	2.72	2.72	0				
cfm/ton	613.31	225.51	0				
ft²/ton	225.51	53.21	0				
Btu/hr-ft²	53.21	-44.65	0				
No. People	90	90	0				

# Room Checksums

By ae

## Zone 3 UFAD Theater

COOLING COIL PEAK		CLG SPACE PEAK		HEATING COIL PEAK		TEMPERATURES	
Peaked at Time: Mo/Hr: 7 / 15		Mo/Hr: 7 / 16		Mo/Hr: 13 / 1			
Outside Air: OADB/WB/HR: 89 / 74 / 102		OADB: 89		OADB: 14			
Space Sens. + Lat. Btu/h	Plenum Sens. + Lat. Btu/h	Net Total Btu/h	Percent Of Total (%)	Space Peak Btu/h	Coil Peak Tot Btu/h	Percent Of Total (%)	
<b>Envelope Loads</b>							
SkyLite Solar	0	0	0.00	0	0	0.00	SADB Cooling 68.0
SkyLite Cond	0	0	0.00	0	0	0.00	Plenum Heating 75.0
Roof Cond	0	0	0.00	0	0	0.00	Return 76.3
Glass Solar	0	0	0.00	0	0	0.00	Ret/OA 79.0
Glass Cond	0	0	0.00	0	0	0.00	Fn MtrTD 0.1
Wall Cond	0	0	0.00	0	0	0.00	Fn BidTD 0.3
Partition	529	529	0.30	559	-348	0.43	Fn Frict 0.9
Exposed Floor	0	0	0.00	0	0	0.00	
Infiltration	0	0	0.00	0	0	0.00	
<b>Sub Total ==&gt;</b>	<b>529</b>	<b>529</b>	<b>0.30</b>	<b>559</b>	<b>-348</b>	<b>0.43</b>	
<b>Internal Loads</b>							
Lights	1,570	1,570	0.90	1,570	0	0.00	
People	48,060	48,060	27.65	29,160	0	0.00	
Misc	0	0	0.00	0	0	0.00	
<b>Sub Total ==&gt;</b>	<b>49,630</b>	<b>49,630</b>	<b>28.55</b>	<b>30,730</b>	<b>0</b>	<b>0.00</b>	
<b>Engineering CKS</b>							
Ceiling Load	0	0	0.00	0	0	0.00	
Ventilation Load	0	0	0.00	0	0	0.00	
Ov/Undr Sizing	0	39,245	22.58	-30,941	-49,843	61.43	
Exhaust Heat	-1,230	-1,230	-0.71	0	-30,941	38.14	
Sup. Fan Heat	5,955	5,955	3.43	0	0	0.00	
Ret. Fan Heat	5,955	5,955	3.43	0	0	0.00	
Duct Heat PkUp	0	73,753	42.43	0	0	0.00	
Reheat at Design	0	0	0.00	0	0	0.00	
<b>Grand Total ==&gt;</b>	<b>50,159</b>	<b>173,836</b>	<b>100.00</b>	<b>-31,289</b>	<b>-81,133</b>	<b>100.00</b>	
<b>Engineering CKS</b>							
% OA	20.7	20.7	0.00	0	0	0.00	
cfm/ft²	2.51	2.51	0.00	0	0	0.00	
cfm/ton	554.92	554.92	0.00	0	0	0.00	
ft²/ton	220.90	220.90	0.00	0	0	0.00	
Btu/hr-ft²	54.32	54.32	0.00	0	0	0.00	
No. People	180	180	0.00	0	0	0.00	
<b>HEATING COIL SELECTION</b>							
Total Capacity ton	7.2	7.2	0.00	0	0	0.00	
Main Clg	7.2	86.9	64.3	4,019	4,019	56.9	
Aux Clg	0.0	0.0	0.0	0	0	0.0	
Opt Vent	0.0	0.0	0.0	0	0	0.0	
<b>Total</b>	<b>7.2</b>	<b>86.9</b>					
<b>AREAS</b>							
Gross Total	1,600	1,600	0.00	0	0	0.00	
Floor	299	299	0.00	0	0	0.00	
Part	0	0	0.00	0	0	0.00	
ExFir	0	0	0.00	0	0	0.00	
Roof	0	0	0.00	0	0	0.00	
Wall	0	0	0.00	0	0	0.00	
<b>HEATING COIL SELECTION</b>							
Capacity MBh	-81.1	-81.1	0.00	0	0	0.00	
Main Htg	4,019	4,019	56.9	0	0	0.00	
Aux Htg	0.0	0.0	0.00	0	0	0.00	
Preheat	0.0	0.0	0.00	0	0	0.00	
Humidif	0.0	0.0	0.00	0	0	0.00	
Opt Vent	0.0	0.0	0.00	0	0	0.00	
<b>Total</b>	<b>-81.1</b>	<b>-81.1</b>					

# Room Checksums

By ae

## Zone 4 UFAD Theater

COOLING COIL PEAK		CLG SPACE PEAK		HEATING COIL PEAK		TEMPERATURES	
Peaked at Time: Mo/Hr: 7 / 15		Mo/Hr: 7 / 15		Mo/Hr: 13 / 1			
Outside Air: OADB/WB/HR: 89 / 74 / 102		OADB: 89		OADB: 14			
Space Sens. + Lat	Plenum Sens. + Lat	Net Total	Space Percent Sensible Of Total	Space Peak	Coil Peak	Percent Of Total	
Btu/h	Btu/h	Btu/h	Btu/h (%)	Btu/h	Btu/h	(%)	
<b>Envelope Loads</b>							
SkyLite Solar	0	0	0.00	0	0	0.00	SADB Cooling Heating
SkyLite Cond	0	0	0.00	0	0	0.00	Plenum 68.0 75.0
Roof Cond	0	24,095	32.74	0	-22,384	433.48	Return 80.1 66.6
Glass Solar	0	0	0.00	0	0	0.00	Ret/OA 80.1 66.6
Glass Cond	0	0	0.00	0	0	0.00	Fn MtrTD 0.1 0.0
Wall Cond	0	0	0.00	0	0	0.00	Fn BidTD 0.3 0.0
Partition	-582	-582	-0.79	-651	-651	12.61	Fn Frict 0.9 0.0
Exposed Floor	0	0	0.00	0	0	0.00	
Infiltration	0	0	0.00	0	0	0.00	
<b>Sub Total ==&gt;</b>	<b>-582</b>	<b>23,512</b>	<b>31.95</b>	<b>-651</b>	<b>-23,035</b>	<b>446.09</b>	
<b>Internal Loads</b>							
Lights	6,665	33,327	45.28	0	0	0.00	Vent Cooling Heating
People	0	0	0.00	0	0	0.00	Infil 0 0
Misc	4,915	4,915	6.68	0	0	0.00	Supply 556 556
<b>Sub Total ==&gt;</b>	<b>11,580</b>	<b>38,242</b>	<b>51.96</b>	<b>0</b>	<b>0</b>	<b>0.00</b>	MinStop/Rh 0 0
							Return 556 556
							Exhaust 0 0
							Rm Exh 0 0
							Auxil 0 0
<b>Ceiling Load</b>							
Ventilation Load	-2,895	2,895	-27.15	-1,205	0	0.00	<b>ENGINEERING CKS</b>
Ov/Undr Sizing	0	0	0.00	-2,469	-2,469	47.82	Cooling Heating
Exhaust Heat	0	0	0.00	0	0	0.00	% OA 0.0 0.0
Sup. Fan Heat	0	823	1.12	0	0	0.00	cfm/ft² 0.20 0.20
Ret. Fan Heat	823	823	1.12	0	0	0.00	cfm/ton 181.18
Duct Heat PkUp	0	10,194	13.85	0	0	0.00	ft²/ton 913.11
Reheat at Design	0	0	0.00	0	20,340	393.91	Btu/hr-ft² 13.14 -1.84
<b>Grand Total ==&gt;</b>	<b>8,103</b>	<b>54,474</b>	<b>100.00</b>	<b>-4,325</b>	<b>-5,164</b>	<b>100.00</b>	No. People 0

COOLING COIL SELECTION		AREAS		HEATING COIL SELECTION	
Total Capacity	Sens Cap.	Gross Total	Glass	Capacity	Coil Airflow
ton	MBh		ft² (%)	MBh	cfm
Main Clg	3.1	2,800	0	-5.2	556
Aux Clg	0.0	559	0	0.0	0
Opt Vent	0.0	6,043	0	0.0	0
<b>Total</b>	<b>3.1</b>	<b>0</b>	<b>0</b>	<b>0.0</b>	<b>0</b>

COOLING COIL SELECTION		AREAS		HEATING COIL SELECTION	
Total Capacity	Sens Cap.	Gross Total	Glass	Capacity	Coil Airflow
ton	MBh		ft² (%)	MBh	cfm
Main Htg	0.0	2,800	0	-5.2	556
Aux Htg	0.0	559	0	0.0	0
Preheat	0.0	6,043	0	0.0	0
<b>Total</b>	<b>0.0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>	<b>0</b>

# Room Checksums

By ae

## Orchestra Pit

COOLING COIL PEAK		CLG SPACE PEAK		HEATING COIL PEAK		TEMPERATURES	
Peaked at Time: Mo/Hr: 7 / 15		Mo/Hr: 7 / 15		Mo/Hr: 13 / 1			
Outside Air: OADB/WB/HR: 89 / 74 / 102		OADB: 89		OADB: 14			
Space Sens. + Lat.	Plenum Sens. + Lat	Net Total	Space Sensible	Space Peak	Coil Peak	Percent	
Btu/h	Btu/h	Btu/h	Btu/h	Btu/h	Tot Sens	Of Total	
						(%)	
<b>Envelope Loads</b>							
Skylite Solar	0	0	0	0	0	0	0.00
Skylite Cond	0	0	0	0	0	0	0.00
Roof Cond	0	0	0	0	0	0	0.00
Glass Solar	0	0	0	0	0	0	0.00
Glass Cond	0	0	0	0	0	0	0.00
Wall Cond	0	0	0	0	0	0	0.00
Partition	0	0	0	0	0	0	0.00
Exposed Floor	0	0	0	0	0	0	0.00
Infiltration	0	0	0	0	0	0	0.00
<i>Sub Total ==&gt;</i>	0	0	0	0	0	0	0.00
<b>Internal Loads</b>							
Lights	655	655	655	6.93	0	0	0.00
People	18,400	18,400	8,800	93.07	0	0	0.00
Misc	0	0	0	0.00	0	0	0.00
<i>Sub Total ==&gt;</i>	19,055	19,055	9,455	100.00	0	0	0.00
<b>Ceiling Load</b>							
Ventilation Load	0	0	0	0.00	0	0	0.00
Ov/Undr Sizing	0	6,524	0	0.00	-8,888	48.45	
Exhaust Heat	-219	-219	0	0.00	-9,455	51.55	
Sup. Fan Heat	1,799	1,799	0	0.00	0	0.00	
Ret. Fan Heat	1,799	1,799	0	0.00	0	0.00	
Duct Heat Pkup	0	22,288	43.49	0.00	0	0.00	
Reheat at Design	0	0	0	0.00	0	0.00	
<b>Grand Total ==&gt;</b>	19,055	51,247	9,455	100.00	-9,455	-18,343	100.00
<b>COOLING COIL SELECTION</b>							
Total Capacity	Sens Cap.	Coil Airflow	Enter DB/WB/HR	Leave DB/WB/HR	Gross Total	Glass	
ton	MBh	cfm	°F	°F		ft²	(%)
Main Clg	2.1	25.6	18.7	63.8	300	0	
Aux Clg	0.0	0.0	0.0	50.2	0	0	
Opt Vent	0.0	0.0	0.0	0.0	0	0	
<b>Total</b>	2.1	25.6	18.7	50.2	300	0	
<b>HEATING COIL SELECTION</b>							
Capacity	Coil Airflow	Ent	Lvg				
MBh	cfm	°F	°F				
Main Htg	18.3	1,215	61.4	75.0	0	0	
Aux Htg	0.0	0.0	0.0	0.0	0	0	
Preheat	0.0	0.0	0.0	0.0	0	0	
Humidif	0.0	0.0	0.0	0.0	0	0	
Opt Vent	0.0	0.0	0.0	0.0	0	0	
<b>Total</b>	18.3	1,215	61.4	75.0	0	0	

Appendix B: ASHRAE Standard 62.1-2004

Room Number	Room Name	Space Description	Area (Sq. Ft)	Occupancy	CFM/ person	CFM/ ft <sup>2</sup>	RpPz	RaAZ	Zone Outdoor Airflow	Zone Primary Airflow	Zone Minimum Airflow	Primary OA Fraction
155	Proscenium Theatre Seating	Auditorium Seating	4,387	502	5	0.06	2510	263	2773	7,900	7900	0.35
155	Proscenium Theatre Seating	Auditorium Seating Redesign	4,387	502	5	0.06	2510	263	2311	14,200	14200	0.16

	Original Design	Redesign
AHU-2 Total Air Flow	7900	14200
$V_{ou}$	2,773	2,773
$E_v$	0.80	0.90
$V_{ot}$	3467	3081
Max $Z_p$	0.35	0.16
Min OA %	0.44	0.22



## Appendix C: Diffuser Specifications

Nailor Industries Inc.  
Floor Swirl Diffuser  
Round Fixed Discharge Pattern  
Model NFD





**FLOOR "SWIRL" DIFFUSER**  
FIXED DISCHARGE PATTERN • ROUND  
UNDERFLOOR AIR DISTRIBUTION SYSTEMS  
MODEL: NFD

**DESCRIPTION:**

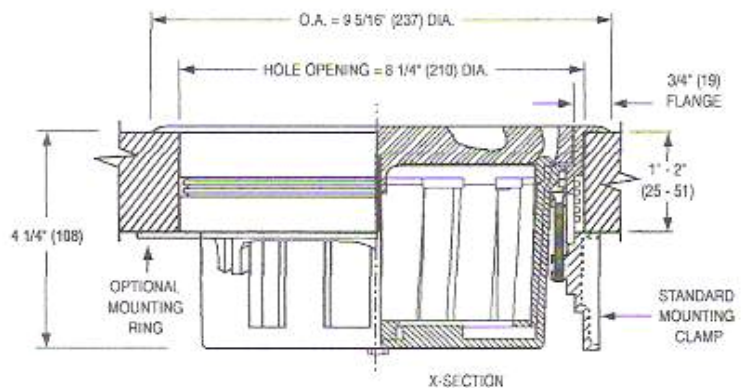
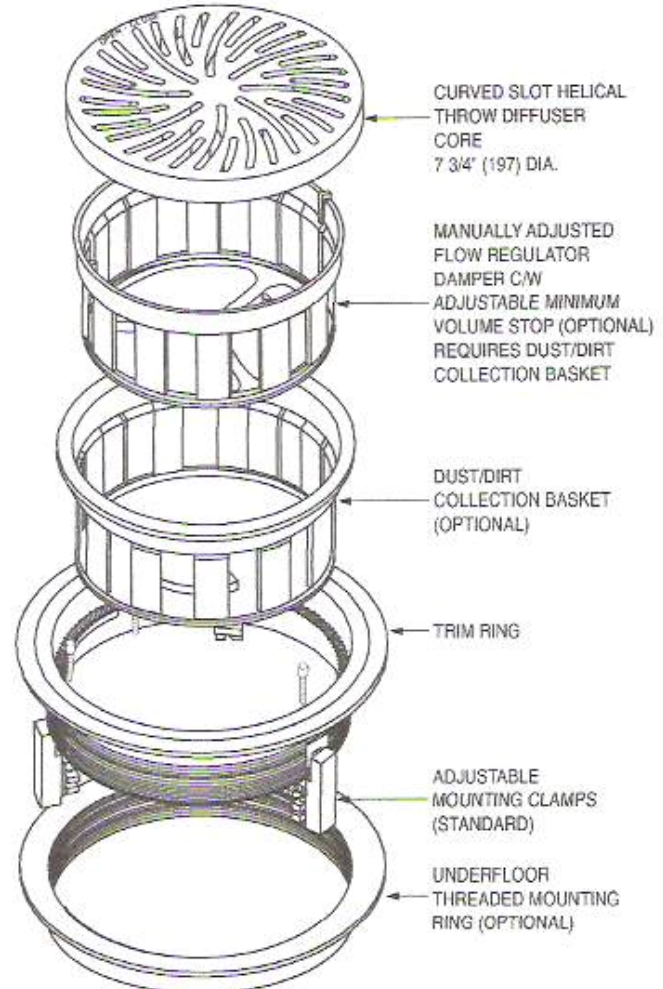
The Nailor NFD floor diffuser is designed for use in raised access floor air distribution systems, where the floor cavity is used as a pressurized supply air plenum. The NFD core design produces a high velocity helical "swirl" discharge air pattern. This design achieves high induction rates of room air which optimizes mixing for maximum comfort conditions.

**FEATURES:**

- Constructed of high impact polycarbonate plastic complying with UL Standard 94-5V for flammability.
- Nominal size 8" (203) dia. Low profile design.
- Dust/dirt collection basket catches anything that might fall through diffuser face. Removable for cleaning.
- Optional flow regulator damper adjustable without removing the diffuser core, features visual open/closed indication and includes built in end stops.
- Adjustable minimum volume stop.
- Low pressure drop core/damper assembly design.
- Architecturally pleasing face design compliments contemporary decor. Lies flush with trim ring flange, with or without damper.
- Rugged trim ring design secures carpet and prevents edges from fraying.
- Unique adjustable mounting clamp design adapts to any floor panel thickness and provides simple and secure installation. Permits installation from above the floor without removal of the floor panel or carpet.
- Optional underfloor mounting ring available.
- Standard finish is GR Gray or BK Black core and trim ring. Damper/basket are black.

**SELECTION:**

1.  TR Trim Ring (standard)  
 None
2. Dirt Basket/Damper  
 BDA Attached to Core (standard)  
 BDL Loose  
 BOO Basket Only  
 None
3. Mounting (requires trim ring):  
 MC Mounting Clamps (standard)  
 MR Mounting Ring (option)
4. Finish:  
 GR Gray  
 BK Black  
 SP Special (custom color by architect)  
Specify \_\_\_\_\_



<b>SCHEDULE TYPE:</b>	
<b>PROJECT:</b>	
<b>ENGINEER:</b>	
<b>CONTRACTOR:</b>	

Dimensions are in inches (mm).

DATE	B SERIES	SUPERSEDES	DRAWING NO.
9 - 26 - 03	NFD	5 - 29 - 03	NFD-1

Nailor Industries Inc. reserves the right to change any information concerning product or pricing without notice.



**FLOOR "SWIRL" DIFFUSERS**  
FIXED DISCHARGE PATTERN • ROUND  
UNDERFLOOR AIR DISTRIBUTION SYSTEMS  
MODELS: NFD, NFD-VAV

**Performance Data**

Airflow, cfm	30	40	50	60	70	80	90	100	110	120
Plenum Pressure	0.012	0.020	0.029	0.040	0.050	0.063	0.077	0.093	0.108	0.125
Vertical Projection, ft. @ 150, 100, 50 fpm	0.1-0.5-1.2	0.4-1.0-2.0	0.8-1.8-2.8	1.2-2.6-3.5	1.6-3.4-4.2	2.2-4.1-4.8	3.1-4.6-5.3	3.9-5.1-5.8	4.6-5.5-6.2	5.2-5.8-6.6
Horizontal Spread, ft. @ 150, 100, 50 fpm	1.0-1.0-1.5	1.0-1.0-2.0	1.5-1.8-2.7	1.7-2.9-4.1	1.9-4.0-5.5	2.1-4.1-5.8	2.5-3.9-5.7	2.9-3.8-5.5	3.1-3.7-5.4	3.3-3.6-5.3
NC	-	-	-	-	-	-	-	15	18	20

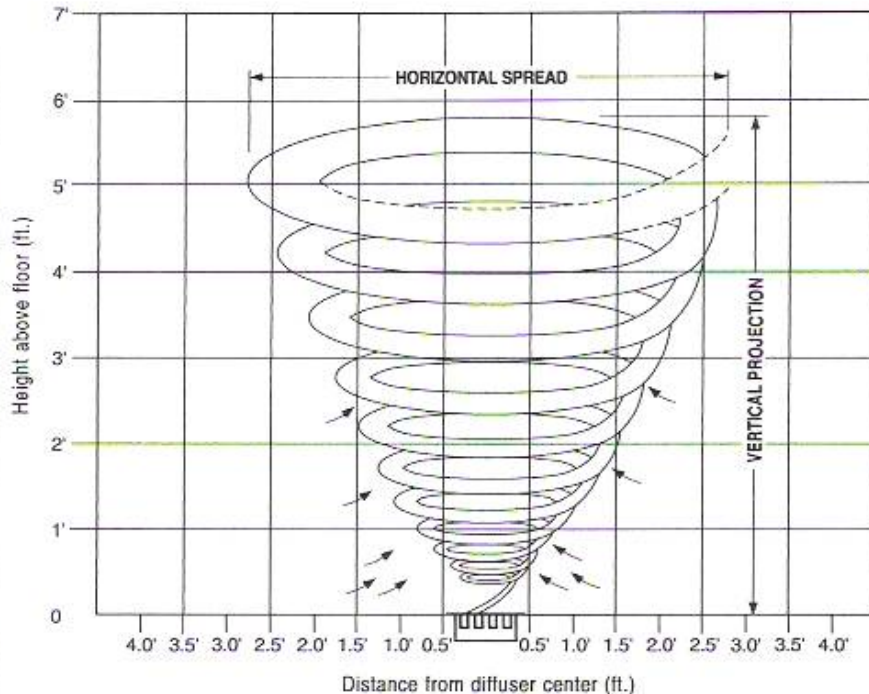
Correction Factor for Return Air Applications: Multiply Plenum Pressure by x 2.65 to determine static pressure drop.

**Correction Factors for other supply air temperature differentials.**

ΔT (°F)	-6	-8	-10	-12	-14	-16
Projection, ft.	x 1.33	x 1.11	x 1.00	x 0.96	x 0.92	x 0.91
Spread, ft.	x 0.87	x 0.94	x 1.00	x 1.06	x 1.11	x 1.16

**Performance Notes:**

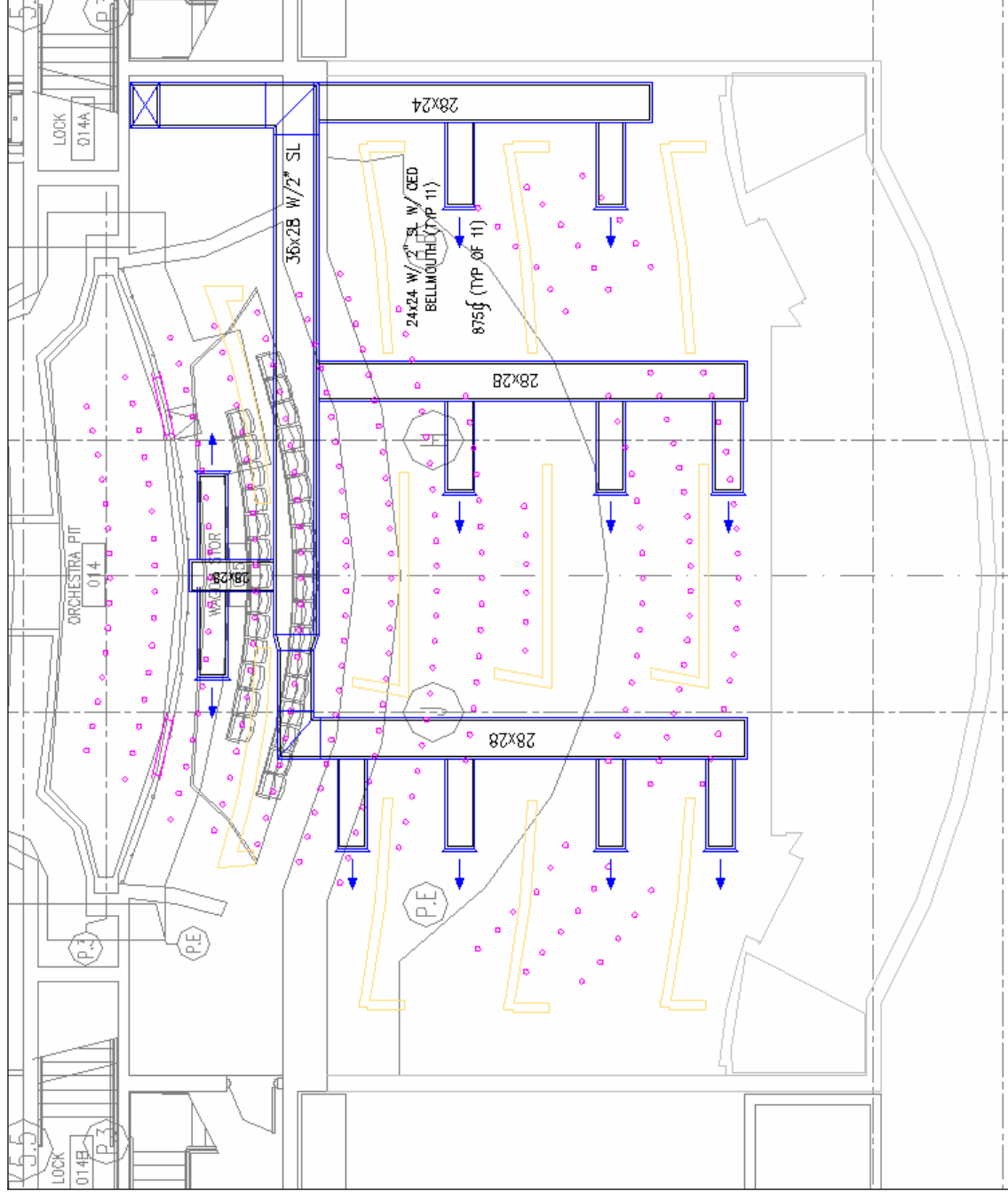
1. Projection and Spread data were determined in a room with a 11' ceiling height and 10°F ΔT, between supply air and averaged occupied room temperature.
2. Vertical projection (throw) is the maximum height above the floor where terminal velocities of 150, 100 and 50 fpm were observed. Horizontal Spread is the total width of the isovel where terminal velocities of 150, 100 and 50 fpm were observed.
3. Noise Criteria (values) based on 10 dB room absorption, re 10<sup>-12</sup> watts. Dash (-) in space denotes an NC value of less than 15.
4. Pressure is in inches w.g..
5. Tests conducted with dirt basket/damper installed. Damper fully open. Ak = 0.104
6. Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 70 - 1991.



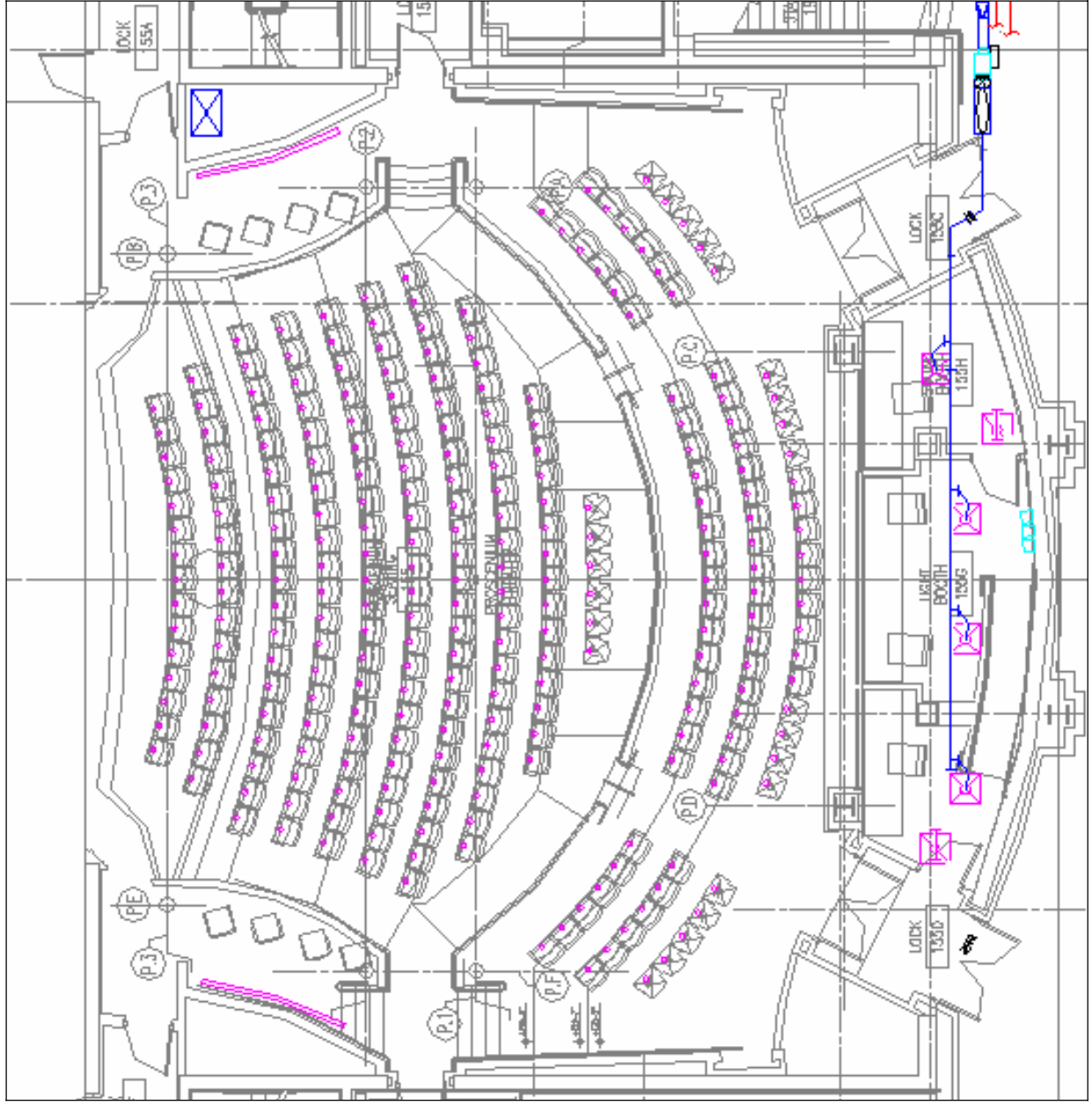
High induction "Swirl" Pattern. 100 cfm supply @10°F ΔT.  
Outline indicates maximum room air velocity of 50 fpm.

SCHEDULE TYPE		Dimensions are in inches (mm).			
PROJECT					
ENGINEER	DATE	B SERIES	SUPERSEDES	DRAWING NO.	
CONTRACTOR	2 - 26 - 04	NFD	9 - 5 - 02	NFD-2	

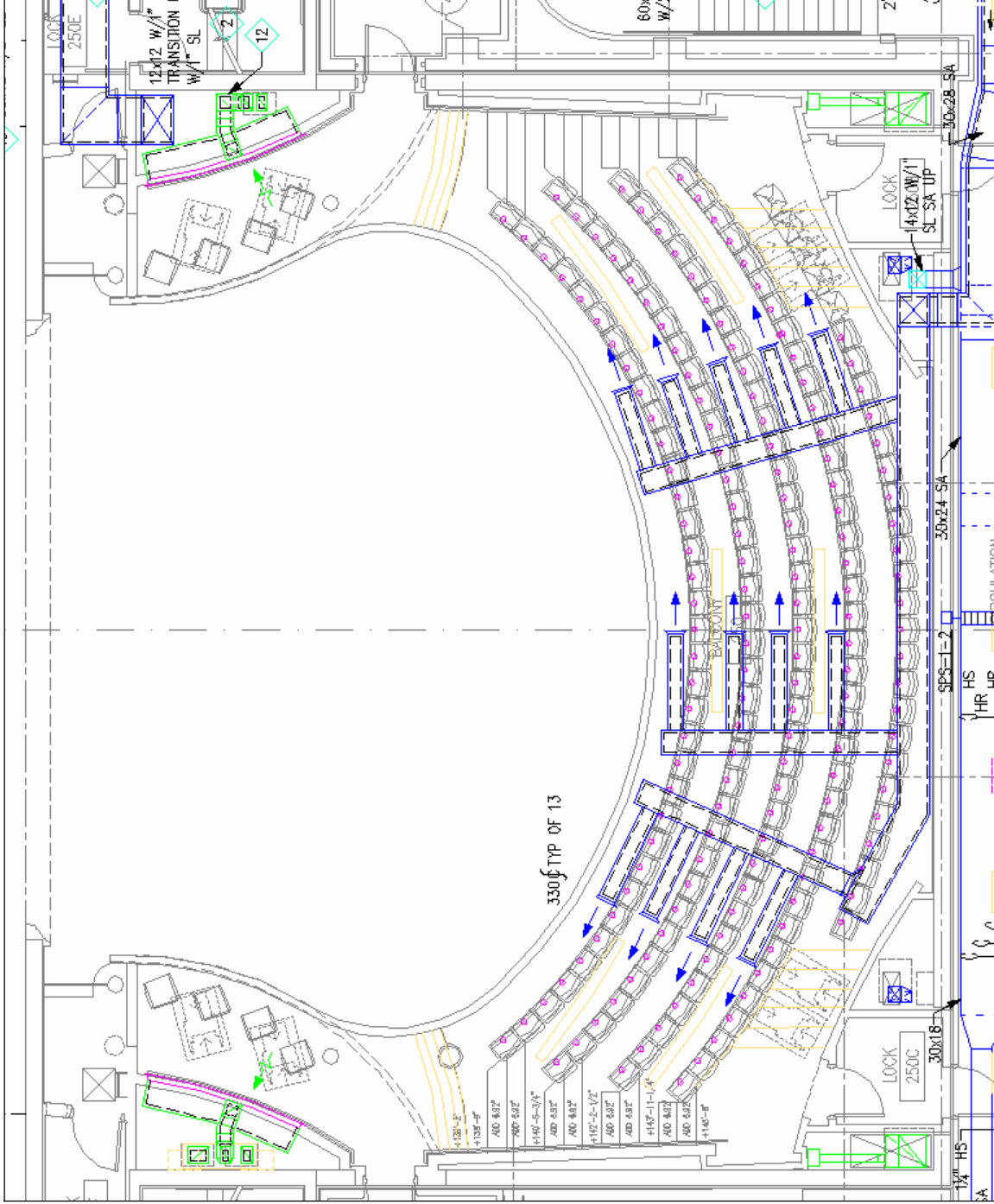
Appendix D: Proscenium Theater Mechanical Plans

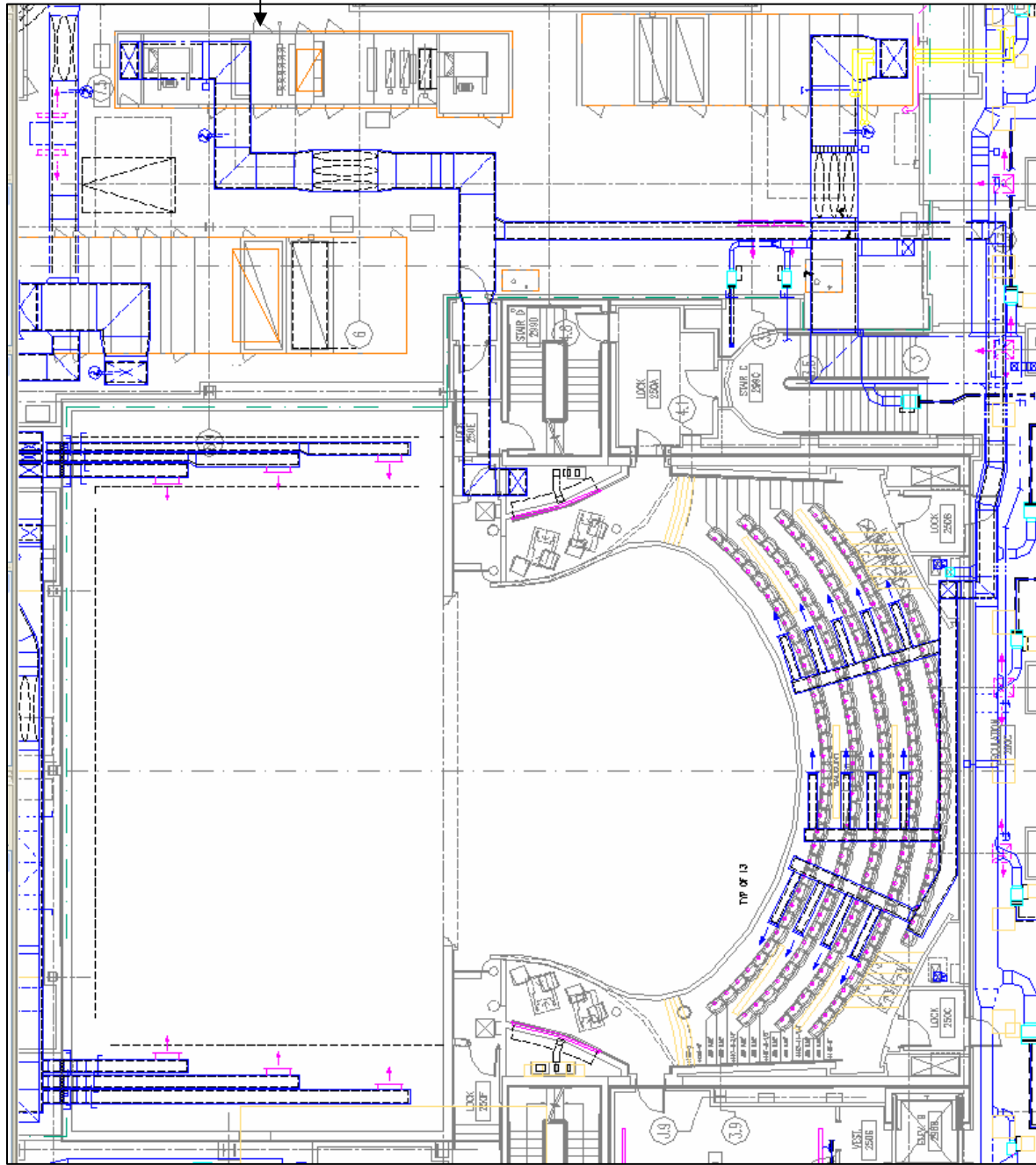


First level  
Mechanical plan



Second level  
(Balcony)  
Mechanical plan





Air Handling Unit 2  
that serves the  
Proscenium Theater

## Appendix E: Rebar Calculations

Assuming fixed on both ends.

$$\text{Load: } w_u = 1.2D + 1.6L$$

$$\text{End moment for fixed-fixed beam: } M_u = \frac{wl^2}{12}$$

$$\text{Middle Moment for fixed-fixed beam: } M_u = \frac{wl^2}{24}$$

$$\phi M_n = \phi A_s F_y \left( d - \frac{a}{2} \right) > M_u$$

$$a = \frac{A_s F_y}{0.85 f'_c b}$$

$$\phi = 0.90$$

$$F_y = 60 \text{ksi}$$

$$f'_c = 4 \text{ksi}$$

$$b = 12 \text{in}$$

$$d = 11 \text{in}$$

Assume dead load of 150psf for weight of concrete and 60psf for seating. Assume live Load of 100psf.

$$w_u = 412 \text{psf}$$

$$\text{End } M_u = 3435 \text{ft} \cdot \text{lb}$$

$$A_s = 0.069 \text{in}^2 / \text{ft rebar}$$

$$\text{Middle } M_u = 1716 \text{ft} \cdot \text{lb}$$

$$A_s = 0.0347 \text{in}^2 / \text{ft rebar}$$

For shrinkage and temperature:  $0.0018(144 \text{in}^2) = 0.26 \text{in}^2 \Rightarrow \text{use \#5 rebar}$

Because of the thickness of the slab (slab > 10") the rebar should be put in the top and bottom of the slab, therefore use #4 rebar in each face both directions.



## Appendix F: Steel Calculations

### *Beams*

Dead load – assume 150psf for concrete and 60psf for fixed seating

$$Slab = 18.8kip$$

$$Seating = 4.3kip$$

Live Load – assume 100psf

$$7.2kip$$

$$w = 1.2(23.1) + 1.6(7.2)$$

$$w = 39.3kip$$

$$M = 39.3kip \times 5'$$

$$M = 196.3 ft \cdot kip$$

From the Beam Design Moments graph in AISC: W16x31

### *Columns*

Unbraced length = 24'

Table 4.2 in AISC:

Original column W10x45 can carry 138kip

Elevated slab doubles the amount of concrete column will need to carry twice as much

W10x60 can carry 280kip

## Appendix G: Theater Calculations

### *Balcony Sightline Angle*

Maximum angle  $30^\circ$

Horizontal length from APS to back row of balcony = 58'

Vertical distance from APS to eye level = 24'

Balcony sightline angle =  $22^\circ$

### *Riser Height*

$$R = \frac{T}{D_B} [E_B + (N - 1)C] + C$$

$T = 3 \text{ ft}$  (row to row spacing)

$D_B = 46.5 \text{ ft}$  (horizontal distance from APS to eye position at front row of balcony)

$E_B = 16.5 \text{ ft}$  (elevation of eye level at front row of balcony above APS)

$N = 5$  (number of rows)

$C = 5 \text{ in}$  (sightline head clearance)

$R = 1.37 \text{ ft}$

Appendix H: TAP Outputs

Octave Band Data - Supply air fan to first level seating area  
Octave Band Data - Supply air fan to balcony level seating area  
NC Curve - First level seating area  
NC Curve – Balcony level seating area  
RC Curve - First level seating area  
RC Curve - Balcony level seating area

# THE TRANE ACOUSTICS PROGRAM

Project Name: Center For the Arts  
 Location: Newark, DE  
 Building Owner: University of Delaware  
 Project Number:  
 Comments:

Path Table View -- Path2:

LINE ELEMENT	Octave Band Data								4k	COMMENTS
	63	125	250	500	1k	2k	4k	8k		
<b>Custom Element</b>	<b>95</b>	<b>93</b>	<b>89</b>	<b>89</b>	<b>87</b>	<b>83</b>	<b>78</b>			
Sound Plenum	-10	-14	-14	1	1	1	-1			Supply air fan AHU 2
Straight Duct(RL)	0	-1	-2	-5	-4	-4	-4			
Elbow (In.sq.rct)	0	-1	-6	-11	-10	-10	-10			
SubSum	85	77	67	74	74	70	63			
<b>SubSum</b>	<b>61</b>	<b>55</b>	<b>49</b>	<b>40</b>	<b>32</b>	<b>23</b>	<b>13</b>			Regenerated sound from elbow.
<b>Straight Duct(RL)</b>	<b>85</b>	<b>77</b>	<b>67</b>	<b>74</b>	<b>74</b>	<b>70</b>	<b>63</b>			
Elbow (In.sq.rct)	-1	-2	-5	-16	-13	-11	-11			
SubSum	-1	-4	-7	-7	-7	-7	-7			
<b>SubSum</b>	<b>83</b>	<b>71</b>	<b>55</b>	<b>51</b>	<b>54</b>	<b>52</b>	<b>45</b>			
<b>Straight Duct(RL)</b>	<b>72</b>	<b>72</b>	<b>70</b>	<b>65</b>	<b>57</b>	<b>46</b>	<b>30</b>			Regenerated sound from elbow.
Elbow (In.sq.rct)	83	75	70	65	59	53	45			
SubSum	-2	-2	-6	-18	-15	-13	-12			
<b>SubSum</b>	<b>80</b>	<b>69</b>	<b>57</b>	<b>40</b>	<b>37</b>	<b>33</b>	<b>26</b>			
<b>Straight Duct(RL)</b>	<b>72</b>	<b>72</b>	<b>70</b>	<b>65</b>	<b>57</b>	<b>46</b>	<b>30</b>			Regenerated sound from elbow.
SubSum	81	74	70	65	57	46	31			
<b>Straight Duct(RL)</b>	<b>-1</b>	<b>-2</b>	<b>-5</b>	<b>-16</b>	<b>-13</b>	<b>-11</b>	<b>-11</b>			
Custom Element	-7	-13	-24	-27	-30	-21	-17			Sound Attenuator 2-1
Straight Duct(RL)	-2	-2	-3	-10	-18	-14	-14			
Elbow (In.sq.rct)	-1	-4	-7	-7	-7	-7	-7			
SubSum	70	53	31	5	5	5	5			

Project Number:

Path Table View -- Path2:

LINE ELEMENT	Octave Band Data								COMMENTS
	63	125	250	500	1k	2k	4k		
SubSum	72	72	70	65	57	46	30		Regenerated sound from elbow.
<b>Junction (90,atten.)ABR</b>	74	72	70	65	57	46	30		
SubSum	-2	-2	-2	-2	-2	-2	-2		
SubSum	72	70	68	63	55	44	28		Regenerated sound from junction.
<b>Straight Duct(RL)</b>	61	56	50	44	36	28	18		
SubSum	72	70	68	63	55	44	28		
<b>Elbow (ln.sq.rct)</b>	-6	-6	-12	-35	-40	-40	-40		
SubSum	-1	-4	-7	-7	-7	-7	-7		
SubSum	65	60	49	21	8	5	5		
<b>Straight Duct(RL)</b>	66	66	63	58	50	38	22		Regenerated sound from elbow.
SubSum	69	67	63	58	50	38	22		
<b>Elbow (ln.sq.rct)</b>	-1	-1	-1	-4	-7	-6	-6		
SubSum	-1	-4	-7	-7	-7	-7	-7		
SubSum	67	62	55	47	36	25	9		
<b>Straight Duct(RL)</b>	66	66	63	58	50	38	22		Regenerated sound from elbow.
SubSum	70	67	64	58	50	38	22		
<b>Elbow (ln.sq.rct)</b>	-8	-8	-17	-40	-40	-40	-40		
SubSum	0	-1	-4	-7	-7	-7	-7		
SubSum	62	58	43	11	5	5	5		
<b>Straight Duct(RL)</b>	64	64	61	56	48	36	20		Regenerated sound from elbow.
SubSum	66	65	61	56	48	36	20		
<b>Junction (T,atten.)</b>	-2	-3	-8	-25	-22	-18	-17		
SubSum	61	59	51	29	24	16	5		
<b>Straight Duct(RL)</b>	54	48	43	35	27	18	8		Regenerated sound from junction.
SubSum	62	59	52	36	29	20	10		
<b>Elbow (ln.sq.rct)</b>	-4	-6	-15	-40	-40	-34	-32		
SubSum	58	53	37	5	5	5	5		
<b>Junction (90,regen)</b>	49	44	37	29	22	12	2		
SubSum	59	54	40	29	22	13	7		
<b>Straight Duct(RL)</b>	-3	-4	-10	-30	-26	-22	-20		
<b>Junction (90,atten.)ABR</b>	-3	-3	-3	-3	-3	-3	-3		
SubSum	53	47	27	5	5	5	5		

Path Table View -- Path2:

LINE ELEMENT	Octave Band Data								COMMENTS
	63	125	250	500	1k	2k	4k		
SubSum	27	22	16	9	2	0	0	0	Regenerated sound from junction.
<b>Straight Duct(RL)</b>	53	47	27	10	7	6	6	6	
SubSum	-3	-4	-10	-29	-26	-22	-20	-20	
<b>Elbow (RctVanes)</b>	50	43	17	5	5	5	5	5	
SubSum	56	55	51	44	34	20	3	3	
SubSum	57	55	51	44	34	20	7	7	
<b>Straight Duct(RL)</b>	-1	-1	-3	-9	-8	-7	-6	-6	
<b>Junction (90,atten.)ABR</b>	-3	-3	-2	-2	-2	-2	-2	-2	
SubSum	53	51	46	33	24	11	5	5	Regenerated sound from junction.
<b>Straight Duct(RL)</b>	21	15	10	3	0	0	0	0	
SubSum	53	51	46	33	24	11	6	6	
<b>Straight Duct(RL)</b>	-2	-3	-8	-23	-21	-17	-16	-16	
<b>Junction (90,atten.)ABR</b>	-3	-3	-2	-2	-2	-2	-2	-2	
SubSum	48	45	36	8	5	5	5	5	Regenerated sound from junction.
<b>Straight Duct(RL)</b>	13	7	0	0	0	0	0	0	
SubSum	48	45	36	9	6	6	6	6	
<b>Straight Duct(RL)</b>	-3	-3	-9	-26	-23	-20	-18	-18	
<b>Junction (90,atten.)ABR</b>	-3	-3	-2	-2	-2	-2	-2	-2	
SubSum	42	39	25	5	5	5	5	5	Regenerated sound from junction.
<b>Straight Duct(RL)</b>	3	0	0	0	0	0	0	0	
SubSum	42	39	25	6	6	6	6	6	
<b>Straight Duct(RL)</b>	-2	-3	-8	-23	-21	-17	-16	-16	
<b>Junction (90,atten.)ABR</b>	-4	-4	-4	-4	-4	-4	-4	-4	
SubSum	36	32	13	5	5	5	5	5	Regenerated sound from junction.
<b>Straight Duct(RL)</b>	0	0	0	0	0	0	0	0	
SubSum	36	32	13	6	6	6	6	6	
<b>Straight Duct(RL)</b>	-2	-3	-7	-19	-17	-15	-13	-13	
<b>Sound Plenum</b>	-16	-18	-18	-20	-20	-20	-21	-21	
SubSum	18	11	5	5	5	5	5	5	Floor diffuser
<b>Custom Element</b>	0	37	28	27	27	23	15	15	
SubSum	18	37	28	27	27	23	15	15	
<b>Indoor (Diffuse)</b>	-9	-9	-9	-9	-9	-9	-9	-9	

Path Table View -- Path2:

LINE ELEMENT	Octave Band Data						COMMENTS
	63	125	250	500	1k	2k	
SUM	9	28	19	18	18	14	6
RATING:	NC 16			RC 17(N)		22	dB A

# THE TRANE ACOUSTICS PROGRAM

Project Name: Center For the Arts  
 Location: Newark, DE  
 Building Owner: University of Delaware  
 Project Number:  
 Comments:

Path Table View -- Path1:

LINE ELEMENT	Octave Band Data								4k	COMMENTS
	63	125	250	500	1k	2k	4k	8k		
<b>Custom Element</b>	<b>95</b>	<b>93</b>	<b>89</b>	<b>89</b>	<b>87</b>	<b>83</b>	<b>78</b>			
Sound Plenum	-10	-14	-14	0	0	0	-2			Supply air fan AHU 2
Straight Duct(RL)	-1	-1	-2	-5	-5	-4	-4			
Elbow (ln.sq.rct)	0	-1	-6	-11	-10	-10	-10			
SubSum	84	77	67	73	72	69	62			
<b>SubSum</b>	<b>67</b>	<b>61</b>	<b>54</b>	<b>47</b>	<b>38</b>	<b>30</b>	<b>19</b>			Regenerated sound from elbow.
<b>Straight Duct(RL)</b>	<b>84</b>	<b>77</b>	<b>67</b>	<b>73</b>	<b>72</b>	<b>69</b>	<b>62</b>			
Elbow (ln.sq.rct)	-2	-2	-5	-16	-14	-12	-11			
SubSum	-1	-4	-7	-7	-7	-7	-7			
SubSum	81	71	55	50	51	50	44			
<b>SubSum</b>	<b>75</b>	<b>75</b>	<b>74</b>	<b>70</b>	<b>63</b>	<b>52</b>	<b>38</b>			Regenerated sound from elbow.
<b>Straight Duct(RL)</b>	<b>82</b>	<b>76</b>	<b>74</b>	<b>70</b>	<b>63</b>	<b>54</b>	<b>45</b>			
Elbow (ln.sq.rct)	-2	-2	-6	-19	-17	-14	-13			
SubSum	-1	-4	-7	-7	-7	-7	-7			
SubSum	79	70	61	44	39	33	25			
<b>SubSum</b>	<b>75</b>	<b>75</b>	<b>74</b>	<b>70</b>	<b>63</b>	<b>52</b>	<b>38</b>			Regenerated sound from elbow.
<b>Straight Duct(RL)</b>	<b>80</b>	<b>76</b>	<b>74</b>	<b>70</b>	<b>63</b>	<b>52</b>	<b>38</b>			
Custom Element	-2	-2	-5	-16	-14	-12	-11			
Straight Duct(RL)	-7	-13	-24	-27	-30	-21	-17			Sound Attenuator 2-1
Elbow (ln.sq.rct)	-2	-2	-4	-11	-19	-16	-15			
SubSum	-1	-4	-7	-7	-7	-7	-7			
SubSum	68	55	34	9	5	5	5			



Project Name: Center For the Arts

Project Number:

Path Table View -- Path1:

LINE ELEMENT	Octave Band Data								COMMENTS
	63	125	250	500	1k	2k	4k	8k	
SubSum	75	75	74	70	63	52	38		Regenerated sound from elbow.
<b>Junction (90,atten.)ABR</b>	76	75	74	70	63	52	38		
SubSum	-4	-4	-4	-4	-4	-4	-4		
SubSum	72	71	70	66	59	48	34		Regenerated sound from junction.
SubSum	59	55	49	43	35	28	19		
SubSum	72	71	70	66	59	48	34		
<b>Straight Duct(RL)</b>	-17	-18	-33	-40	-40	-40	-40		
<b>Elbow (ln.sq.rct)</b>	0	-1	-4	-7	-7	-7	-7		
SubSum	55	52	33	19	12	5	5		
SubSum	61	61	60	56	49	39	25		Regenerated sound from elbow.
SubSum	62	62	60	56	49	39	25		
<b>Straight Duct(RL)</b>	-12	-13	-23	-40	-40	-40	-40		
<b>Elbow (ln.sq.rct)</b>	0	-1	-4	-7	-7	-7	-7		
SubSum	50	48	33	9	5	5	5		
SubSum	61	61	60	56	49	39	25		Regenerated sound from elbow.
SubSum	61	61	60	56	49	39	25		
<b>Straight Duct(RL)</b>	-1	-1	-2	-5	-9	-8	-7		
<b>Elbow (ln.sq.rct)</b>	0	-1	-4	-7	-7	-7	-7		
SubSum	60	59	54	44	33	24	11		
SubSum	61	61	60	56	49	39	25		Regenerated sound from elbow.
SubSum	64	63	61	56	49	39	25		
<b>Straight Duct(RL)</b>	-2	-2	-4	-10	-19	-16	-13		
<b>Elbow (ln.sq.rct)</b>	0	-1	-4	-7	-7	-7	-7		
SubSum	62	60	53	39	23	16	5		
SubSum	61	61	60	56	49	39	25		Regenerated sound from elbow.
SubSum	65	64	61	56	49	39	25		
<b>Straight Duct(RL)</b>	-2	-2	-4	-10	-19	-16	-13		
SubSum	63	62	57	46	30	23	12		
<b>Junction (90,regen)</b>	52	47	42	35	29	20	12		
SubSum	63	62	57	46	33	25	15		
<b>Straight Duct(RL)</b>	-3	-4	-6	-16	-31	-27	-22		
<b>Junction (90,atten.)ABR</b>	-3	-3	-3	-3	-3	-3	-3		
SubSum	57	55	48	27	5	5	5		

Project Name: Center For the Arts

Project Number:

Path Table View -- Path1:

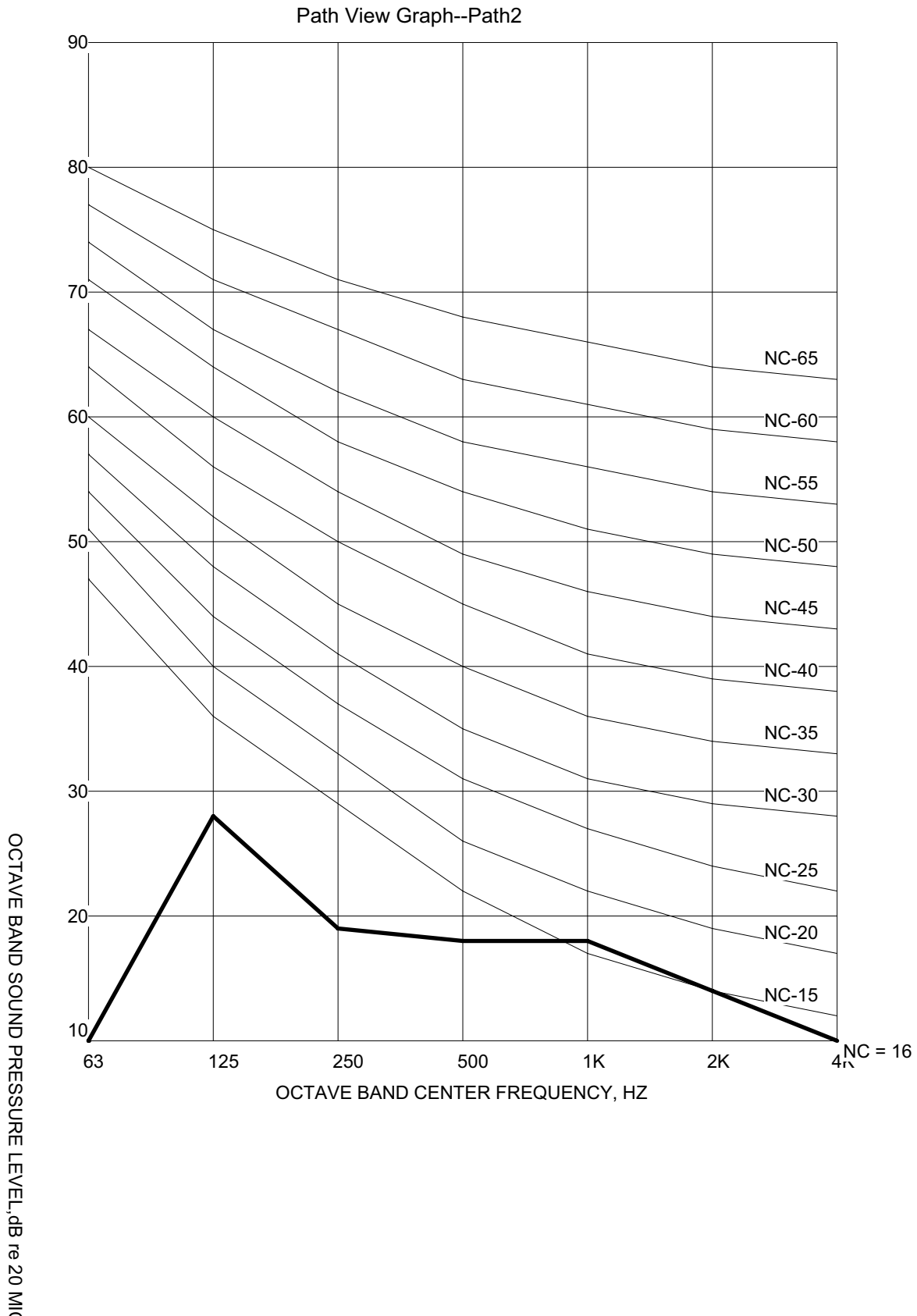
LINE ELEMENT	Octave Band Data							COMMENTS
	63	125	250	500	1k	2k	4k	
SubSum	37	32	26	19	10	2	0	
<b>Straight Duct(RL)</b>	57	55	48	28	11	7	6	Regenerated sound from junction.
SubSum	-7	-7	-11	-26	-40	-40	-36	
<b>Elbow (RctVanes)</b>	50	48	37	5	5	5	5	
SubSum	61	61	57	51	42	29	13	
SubSum	61	61	57	51	42	29	14	
<b>Straight Duct(RL)</b>	-1	-1	-3	-8	-14	-11	-11	
<b>Sound Plenum</b>	-18	-18	-18	-20	-20	-20	-21	
SubSum	42	42	36	23	8	5	5	
<b>Custom Element</b>	0	37	28	27	27	23	15	Floor diffuser
SubSum	42	43	37	28	27	23	15	
<b>Indoor (Diffuse)</b>	-9	-9	-9	-9	-9	-9	-9	
<b>SUM</b>	33	34	28	19	18	14	6	
<b>RATING:</b>	NC 16			RC 17(N)		25 dBA		

# Trane Acoustics Program

University of Delaware  
Center for the Arts

Project Name: Center For the Arts  
Location: Newark, DE  
Building Owner: University of Delaware  
Program User: Karen Schulte  
File Name: P:\THESIS\AHU2.PDT  
Run Date: 03/29/06  
Project Number:

Karen Schulte  
Mechanical Option

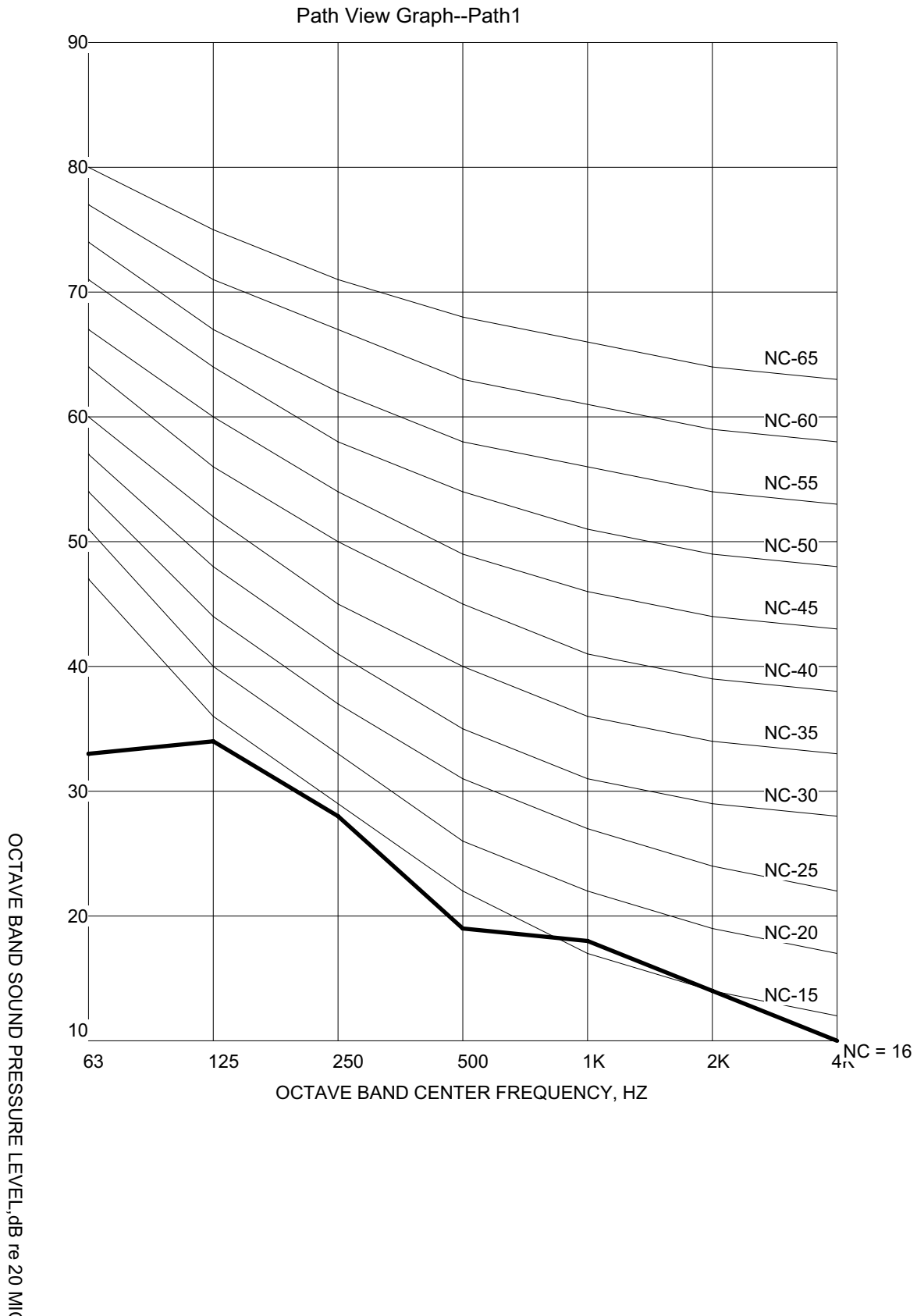


# Trane Acoustics Program

University of Delaware  
Center for the Arts

Project Name: Center For the Arts  
Location: Newark, DE  
Building Owner: University of Delaware  
Program User: Karen Schulte  
File Name: P:\THESIS\AHU2.PDT  
Run Date: 03/29/06  
Project Number:

Karen Schulte  
Mechanical Option



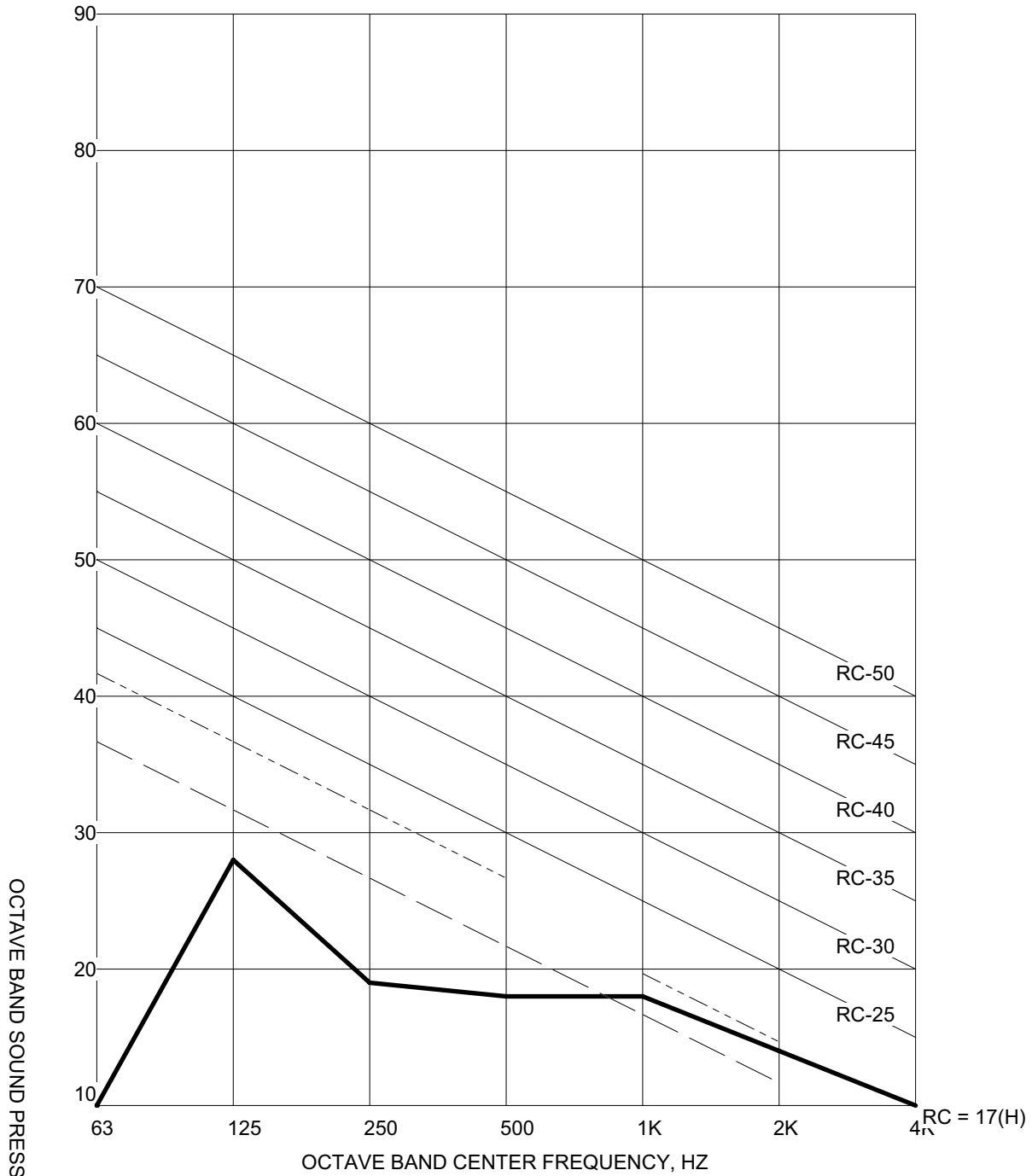
# Trane Acoustics Program




University of Delaware  
Center for the Arts

Project Name: Center For the Arts  
 Location: Newark, DE  
 Building Owner: University of Delaware  
 Program User: Karen Schulte  
 File Name: P:\THESIS\AHU2.PDT  
 Run Date: 03/29/06  
 Project Number:

Karen Schulte  
Mechanical Option

Path View Graph--Path2



 Decibel (dB) Levels  
 Maximum Permitted Deviation  
 Reference Line

OCTAVE BAND SOUND PRESSURE LEVEL, dB re 20 MIC

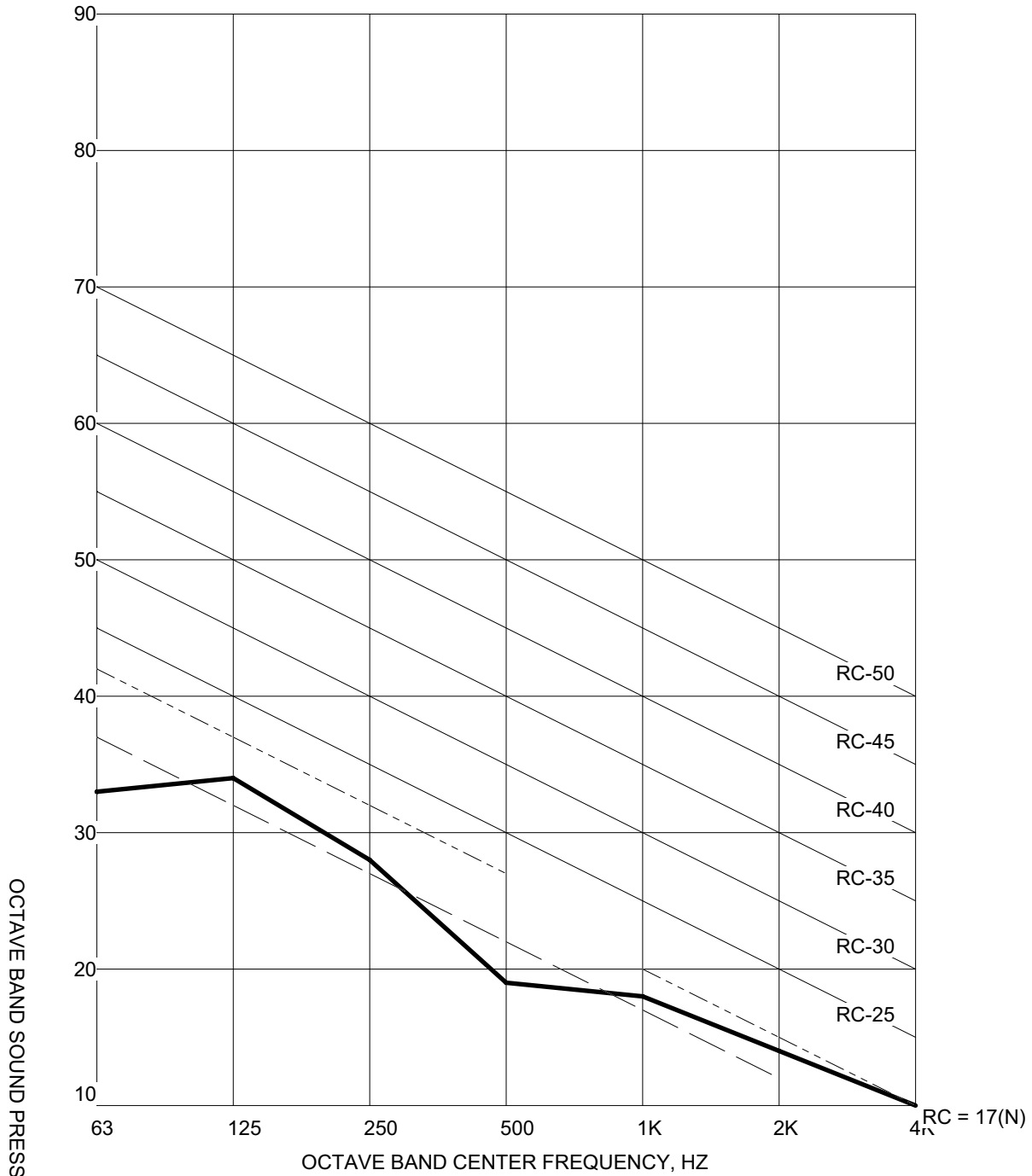
# Trane Acoustics Program

University of Delaware  
Center for the Arts

Project Name: Center For the Arts  
 Location: Newark, DE  
 Building Owner: University of Delaware  
 Program User: Karen Schulte  
 File Name: P:\THESIS\AHU2.PDT  
 Run Date: 03/29/06  
 Project Number:

Karen Schulte  
Mechanical Option

Path View Graph--Path1



OCTAVE BAND SOUND PRESSURE LEVEL, dB re 20 MIC

- Decibel (dB) Levels
- Maximum Permitted Deviation
- Reference Line