APPENDIX F

Noise

USTA Tennis Center Noise Measurement Results Noise Appendix Parking Garage Analysis Parking Lot A

#### Build

#### 1) Parking Garage

Leq @ 50 Feet =		SEL ref 92	+	CN -3.7366	-	35.6 35.6
	=	52.7	1			
Usage Factor	=	1.0				
SEL ref =	92					
# of autos per hour =	423					
Leq @ 50 Feet =		52.7				

Receptor	Distance (feet)	Leq (1-Hour)		
1	3050	17.0		
2	2000	20.7		
3	800	28.6		
4	720	29.5		

#### **No Action**

#### 1) Park and Ride

Receptor	Distance (feet)	Leq (1-Hour)
1	3050	19.7
2	2000	23.4
3	800	31.3

# Parking Lot B **Build**

#### 1) Parking Garage

Leq @ 50 Feet =		SEL ref 92	+	CN -4.31798	-	35.6 35.6
	=	52.1	1			
Usage Factor	=	1.0				
SEL ref =	92					
# of autos per hour =	370					
Leq @ 50 Feet =		52.1				

Receptor	Distance (feet)	Leq (1-Hour)
1	1350	23.5
2	1400	23.2
3	2000	20.1
4	720	20.4

#### **No Action**

#### 1) Park and Ride

Leq @ 50 Feet =		SEL ref	+	CN	-	35.6
		101		-13.0103		35.6
	=	52.4				
Usage Factor	=	1.0	•			
SEL ref =	101					
# of autos per hour =	100		_			
Leq @ 50 Feet =		52.4				

Receptor	Distance (feet)	Leq (1-Hour)
1	1350	23.8
2	1400	23.5
3	2000	20.4

USTA Tennis Center Noise Measurement Results Noise Appendix

Parking Garage Ana	ılysis
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				Exis	sting/No Ac	tion		Future W	ith Action	
SiteID	Location	Time		Parking Lot A L <sub>eq</sub>	Parking Lot B L <sub>eq</sub>	Total L <sub>eq</sub>	Parking Lot A L <sub>eq</sub>	Parking Lot B L <sub>eq</sub>	Total L <sub>eq</sub>	Build Increment
		WD	MD	19.7	23.8	63.1	17.0	23.5	63.1	0.0
4	Promenade of Industry North of	VVD	PM	19.7	23.8	61.3	17.0	23.5	61.3	0.0
1	Industry Pond	WE	MD	19.7	23.8	61.7	17.0	23.5	61.7	0.0
		VV L	PM	19.7	23.8	60.3	17.0	23.5	60.3	0.0
	Herbert Hoover Promenade	WD	MD	23.4	23.5	55.9	20.7	23.2	55.9	0.0
2	between United Nations Avenue		PM	23.4	23.5	58.3	20.7	23.2	58.3	0.0
2	and Avenue of Commerce	WE	MD	23.4	23.5	57.6	20.7	23.2	57.6	0.0
	and Avenue of Commerce	VV	PM	23.4	23.5	63.5	20.7	23.2	63.5	0.0
	United Nations Avenue between	WD	MD	31.3	20.4	63.2	28.6	20.1	63.2	0.0
3	United Nations Avenue between Avenue of Science and Grand	VVD	PM	31.3	20.4	62.9	28.6	20.1	62.9	0.0
3		WE	MD	31.3	20.4	62.7	28.6	20.1	62.7	0.0
	Central Parkway		PM	31.3	20.4	63.6	28.6	20.1	63.6	0.0

### USTA Tennis Center Noise Measurement Results

SiteID	Location			L <sub>eq</sub>	L <sub>1</sub>	L <sub>10</sub>	L <sub>50</sub>	L <sub>90</sub>	L <sub>Min</sub>	L <sub>Max</sub>	
Ontoid	Loodiioii					-					
		WD	12:29 PM	63.1	72.9	63.8	61.1	59.6	56.8	78.9	
				4:31 PM	61.3	68.0	62.4	60.7	59.4	58.5	74.7
			11:12 AM	61.7	70.1	63.5	60.0	58.6	57.5	74.8	
1 1	Promenade of Industry North of Industry		12:58 PM	62.1	68.6	63.0	59.6	58.1	56.5	84.7	
'	Pond	WE	3:09 PM	62.1	66.6	63.0	61.6	60.6	59.7	77.8	
		''-	4:54 PM	62.4	65.0	63.9	62.1	60.9	59.3	69.5	
			6:36 PM	61.8	64.2	63.1	61.7	60.4	58.8	67.0	
			8:13 PM	60.3	62.5	61.0	60.1	59.3	58.3	68.5	
	Herbert Hoover Promenade between United Nations Avenue and Avenue of	WD	1:06 PM	55.9	61.5	57.5	55.2	53.8	53.0	64.8	
			5:07 PM	58.3	63.2	59.3	57.8	56.6	55.4	72.0	
		United Nations Avenue and Avenue of		11:39 AM	57.8	64.7	59.4	56.9	55.5	54.3	71.3
2			1:28 PM	57.6	62.7	59.0	57.1	55.8	54.7	68.0	
			WE	3:35 PM	59.9	64.4	61.3	59.4	58.2	56.5	69.1
			5:22 PM	63.5	73.6	64.9	61.3	59.5	58.0	80.3	
			7:03 PM	63.6	71.3	65.8	62.0	60.1	58.6	76.7	
		WD	1:42 PM	63.2	69.4	64.8	62.3	61.2	58.4	76.2	
		WD	5:48 PM	62.9	67.6	64.9	62.2	60.7	58.8	75.2	
	United Nations Avenue between Avenue of		12:16 PM	64.4	72.0	65.4	63.2	62.1	60.5	78.1	
3	Science and Grand Central Parkway		2:04 PM	62.7	66.4	63.9	62.4	61.4	60.1	68.1	
	Science and Grand Gentral Larkway	WE	4:12 PM	64.2	67.4	65.5	63.8	62.9	61.8	69.4	
			5:57 PM	64.9	72.2	66.4	63.8	62.5	61.5	77.4	
			7:34 PM	63.6	68.4	64.6	63.0	62.0	60.5	73.5	
			11:29 AM	72.1	76.2	73.8	71.6	70.3	69.0	82.1	
15	15 feet South of Louis Armstrong Stadium		3:37 PM	72.0	77.6	73.3	71.3	70.1	68.9	82.1	
			7:54 PM	72.0	75.5	73.9	71.5	70.0	68.7	78.1	
			11:56 AM	72.5	78.8	74.7	71.6	69.3	67.7	83.4	
65	feet South of Louis Armstrong Stadium	WD	4:00 PM	71.9	76.6	73.7	71.1	69.6	67.8	85.8	
			8:17 PM	71.6	76.7	73.9	70.7	68.9	67.4	82.8	

Projec				_			r r r
	t Name		Tennis Center		-11	Date	8/31/11
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Period Time L1	11:29	2 L50	# Bus	Lmin	# Motorcycle	Lea	# Airplane/ Train
Γime ₋1	76.0 76		# Bus 71:4 71.6	Lmin	# Motorcycle	Leq	
Γime .1 .10	76.0 76	3.8 L90	# Bus 74.4 71.6 702 70.3	Lmax	# Motorcycle 69.0 82.1	Leq Lpeak	# Airplane/ Train
Time .1 .10 Note: \	76.0 76	3.8 L90	# Bus 71.4 71.6 702 70.3 Se greater th	Lmax	# Motorcycle 69.0 82.1 Fadium lamplified		# Airplane/ Train
Time 1 10 Note: \ Period	76.0 76 73.6 7 0002	3.8 L90	# Bus  71.4 71.6  70.2 70.3  Se greater the  # Adtomobile	Lmax	# Motorcycle 69.0 82.1 Hadium (amplified) # Medium Truck		# Airplane/ Train 72.\ Heavy Truck
Time _1 _10 Note: \ Period Time	76.0 76 73.6 7 6002 15:37	2.8 L90	# Bus  702 70,3  Se greater the  # Adtomobile  # Bus	Lmax	# Motorcycle 69.0 82.1 # Medium (amplified) # Medium Truck # Motorcycle	Lpeak )	# Airplane/ Train   7Z.\   # Heavy Truck   # Airplane/ Train
Time  1  10  Note: \ Period Time  1	76.0 76 73.6 7 6002 15:37 77.4 7	3.8 L90 ped noi	# Bus 702 70.3 Se creater th # Adtomobile # Bus 71.2 71.3	Lmax	# Motorcycle 69.0 82.1 # Medium (amplified) # Medium Truck # Motorcycle [K.9]	Lpeak Leq	# Airplane/ Train 72.\ Heavy Truck
Time .1 .10 Note: \ Period Time .1	76.0 76 73.6 7 6002 15:37 77.4 7 73.2 7	2.8 L90	# Bus  702 70,3  Se greater the  # Adtomobile  # Bus	Lmax	# Motorcycle 69.0 82.1 # Medium (amplified) # Medium Truck # Motorcycle	Lpeak )	# Airplane/ Train   7Z.\   # Heavy Truck   # Airplane/ Train
Fime  1  10  Note:  Period  Fime  1  10  Note:	76.0 76 73.6 7 6002 15:37 77.4 7 73.2 7	3.8 L90 ped noi	# Bus 702 70,3 SE greater th # Adtomobile # Bus 71.2 71.3 70.0 70.1	Lmax	# Motorcycle 69.0 82.1 # Medium (amplified) # Medium Truck # Motorcycle 1/8.9	Lpeak Leq	# Airplane/ Train  72.\  # Heavy Truck # Airplane/ Train  72.0 72.\
Time .1 .10 Note: \ Period Time .1 .10 Note: \ Period	76.0 76 73.6 7 600 2 15:37 77.4 7 73.2 7	3.8 L90 ped noi	# Bus 70.2 70.3  Se creater th  # Adtomobile  # Bus 71.2 71.3  70.0 70.1	Lmax	# Motorcycle  69.0  82.1  # Medium Truck  # Motorcycle  [AS.9]  82.1	Lpeak Leq	# Airplane/ Train  72.1  # Heavy Truck # Airplane/ Train  72.0 72.1  # Heavy Truck
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Period Time .1 .10 Period Time .1 .10 Note: \ Period Time .1 .10 Note: \ Period Time .1 .10 Note: \ Period	76.0 76 73.6 7 6002 15:37 77.4 7 73.2 7 0008 11:54 75.4 7 73.8 7	3.8 L90 Ped noi 1.6 L50 3.3 L90	# Bus 71.4 71.6 70.2 70.3  SE Creater th # Adtomobile # Bus 71.2 71.3 70.0 70.1  # Automobile # Bus 71.4 71.5 70.0	Lmax Lmin Lmax Lmax	# Motorcycle 69-0 82.1 # Medium Truck # Motorcycle 166.9 # Medium Truck # Motorcycle 68.7 # Medium Truck	Leq Lpeak	# Airplane/ Train  72.\  # Heavy Truck # Airplane/ Train  72.0 72.\  # Heavy Truck # Airplane/ Train
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	76.6	L50	71.1	Lmin	67.8	Leq	71.9							
L10	73.5 73.	L90	1A.4 69.60	Lmax	85.8	Lpeak								
	0009	_		-										
Period			# Automobile		# Medium Truck		# Heavy Truck							
	20:17		# Bus		# Motorcycle		# Airplane/ Train							
L1	76.6 76.7		706 70,7	Lmin	67.4	Leq	71.6							
L10	73.8 73.9	L90	68.8 68.9	Lmax	82.8	Lpeak								
Note: \	0015				W-14	***************************************								
Period			# Automobile		# Medium Truck	ľ	# Heavy Truck							
Time			# Bus		# Motorcycle		# Airplane/ Train							
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L10		L90		Lmax										
_ 10		ILOU		LIIIdX		Lpeak								
Note:														

Project Name	USTA	Tennis Cent	er	4/-	Date	18/31/11
Location	Promena	de of Industr	a Ime	redigitely Not Pond	# Site	4
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1 72.8 - -10 63.8	L90	59.4 59.6	Lmin	56.8	Leq	63.1
Note: \0004			Lmax	178.9	Lpeak	<u> </u>
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		# Automobile	-	# Medium Truck	-	# Heavy Truck
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1 680		60.6 60.7	Lmin	58.5 74.7	Leq	61.3
Note: \0010	red Iran	59.2 59.4	Lmax	179.7	Lpeak	
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Fime		# Automobile	-	# Medium Truck		# Heavy Truck
1 me	L50	# Bus	l min	# Motorcycle	1.50	# Airplane/ Train
_10	L90		Lmin		Leq	
Note:	Iran		Lmax		Lpeak	
		Ти А. и 1-11 -		In a a - at		In
Period		# Automobile		# Medium Truck		# Heavy Truck
Time	1.55	# Bus	ļ	# Motorcycle		# Airplane/ Trair
_10	L50	-	Lmin		Leq	
10 I	L90	1	Lmax	1	Lpeak	
Note:				J		

Project Name	USTA	Tennis Stadium	1	Date 9/3/11
Location	North of	Industry Pond	(Promende of Industry)	# Site 🗲 🗸
Equipment /	Meter 5	SN: 2384814	Date: 7/26/()	Observer:
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Dlan View				

see previous drawing

			V	`		
		# Automobile		# Medium Truck		# Heavy Truck
11:12		# Bus		# Motorcycle		# Airplane/ Train
70.1	L50	60.0	Lmin	57.5	Leq	61.7
63.5	L90	58.6	Lmax	74.8	Lpeak	
6017 80°F,	9mph	many socier	gam	es aping on paused -	Er plan	es event vehicle
		# Automobile		# Medium Truck *	,	# Heavy Truck
12:58		# Bus		# Motorcycle		# Airplane/ Train
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63.0	L90	58,0 58.1	Lmax	84.7	Lpeak	
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		# Automobile		# Medium Truck		# Heavy Truck
15:09		# Bus		# Motorcycle		# Airplane/ Train
66-6	L50	61.6	Lmin	59.7	Leq	63-5 62.1
63.0	L90	604-606	Lmax	17.8	Lpeak	
0023 80°F	Umph	phused	for ol	ares, event vehicles		
		# Automobile	,	# Medium Truck		# Heavy Truck
110:54		# Bus		# Motorcycle		# Airplane/ Train
648 650	L50	62.0 62.1	Lmin	59.3	Leq	62.4
635 639	L90	60.9	Lmax	10.5	Lpeak	
0026 81°F 1	Dinih			*		
	12:58 63.5 63.5 63.6 63.0 0020 87°F 15:09 66.6 63.0 0023 80°F 16:54 64.8 65.0 63.9	12:58  63.5  12:58  63.0  15:09  63.0  15:09  66.6  63.0  15:09  66.6  63.0  10:54  64.8  65.0  10:54  64.8  65.0  10:54	11:12			

# NOISE MONITORING FIELD DATA SHEET AKRF, Inc.

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Project	Name	UST	A Te	nnis Studium			Date	9/3/11
Locatio	on	North			on Pa	omenade of Industry	# Site	4'
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Period				# Automobile		# Medium Truck		# Heavy Truck
Time	18:36			# Bus		# Motorcycle		# Airplane/ Train
L1	64.0 6	1,2	L50	61.6 61.7	Lmin	58.8	Leq	61.8
L10	63.0 6	3.1	L90	60.4	Lmax	67.0	Lpeak	
Note: ∖	0029	77°F	9mpl	)				
Period			-	# Automobile		# Medium Truck		# Heavy Truck
Time	20:13			# Bus		# Motorcycle		# Airplane/ Train
L1		2.5	L50	60.0 60,1	Lmin	58.3	Leq	60.3
L10	61.0		L90	59.2 59.3	Lmax	68.5	Lpeak	
Note: \	0032	76°F,			*	1000		
Period				# Automobile	1	# Medium Truck		# Heavy Truck
Time				# Bus		# Motorcycle		# Airplane/ Train
L1			L50		Lmin	-	Leq	
L10			L90		Lmax		Lpeak	
Note:								
Period				# Automobile		# Medium Truck		# Heavy Truck
Time				# Bus		# Motorcycle		# Airplane/ Train
L1			L50		Lmin		Leq	
L10			L90		Lmax		Lpeak	-

Note:

Desired Name	1 . K-74 -	· 7 1			15.	
Project Name		nnis Center		A 1.4 A.7	Date	8/31/11
Location	H. Hoover +	romenade by	UN	Ave & Ave of Commerce	# Site	15
Equipment /	Meter SN	: 2384814	Date		Observ	/er:
Calibration Info	Mic SN	2385722	Date	1,00/11	-	iristian
	Calib SN	2688762	Date	8/3/ ii		(11311K-1
Plan View					1	1
		Pool				
Herbert	Hoover	Promenade			/	
		X				3
	Grass	y Area			1	M Avenue
	Promena	de				3
Period		# Automobile		# Medium Truck		# Heavy Truck
Time 13:06		# Bus		# Motorcycle		# Airplane/ Train
L1 61.4 61	5 L50	550 55.2	Lmin	53.0	Leq	55.9
L10 57.4 5	7.5 L90	53.8	Lmax	64.8	Lpeak	55.7
	rused for	planes, wehicles		100		<u> </u>
Period	12	# Automobile		# Medium Truck		# Heavy Truck
Time 17:07		# Bus		# Motorcycle		# Airplane/ Train
L1 63.0 63	3, 2 L50	57.8	Lmin	55.4	Leq	58.3
L10 59.2 5	1.3 L90	56.4 56.6	Lmax	72.0	Lpeak	30.3
	used for	planes event	whic		pount	l.
Period	1111	# Automobile	UC PUC	# Medium Truck		# Heavy Truck
Time		# Bus		# Motorcycle		# Airplane/ Train
L1	L50	540	Lmin	n wotoroyold	Leq	THE THE PLANT TO A T
L10	L90		Lmax		Lpeak	
Note:	1200		LINGA		LPEAK	
Period		# Automobile		# Medium Truck		# Hoose Trick
Time		# Bus		# Motorcycle		# Heavy Truck
L1	L50	# DUS	Lmin	# IVIOLOTCYCIE	Loc	# Airplane/ Train
L10	L90		Lmin		Leq	
Note:	Iran		Lmax		Lpeak	
1010.						

USTA	Tennis Stadium		Date   9/3/11
H. Hoos	ver Promenade by	UN Ave & Ave of Commerce	# Site 5
Meter	SN: 2384814	Date: 7/26/11	Observer:
Mic	SN: 2385722	Date: 7/26/11	Christian
Calib	SN: 180010Z	Date: 7/26/11	Christian
	Meter Mic	Meter SN: 2384814 Mic SN: 2385722	H. Hoover Promende Hru UN Ave & Ave of Commence   Meter   SN: 2384814   Date: 7/26/11   Mic   SN: 2385722   Date: 7/26/11

Plan View

see previous drawing

Period			# Automobile		# Medium Truck		# Heavy Truck
Time	11:39		# Bus		# Motorcycle		# Airplane/ Train
L1	64.6 64.7	L50	56.8 56.9	Lmin	54.3	Leq	57.8
L10	59.4	L90	55.4 55.5	Lmax	171.3	Lpeak	
Note: \	0018 78°F	, 7mpl	aused for	ohne	\$		
Period			# Automobile	,	# Medium Truck		# Heavy Truck
Time	13:28		# Bus		# Motorcycle		# Airplane/ Train
L1	62.6 62.7	L50	57.0 57.1	Lmin	54.7	Leq	57.6
L10	59.0	L90	55.6 55.8	Lmax	68.0	Lpeak	
Note: \	0021 82°F	,7mo	h paused for	planes	entuchicles		
Period		5	# Automobile	0	# Medium Truck	0	# Heavy Truck
Time	15:35	D	# Buş	0	# Motorcycle	0	# Airplane/ Train
L1	64.4	L50	59.4	Lmin	56.5	Leq	59.9
L10	61.2 61.3	L90	58.0 58.2	Lmax	69.1	Lpeak	
Note:	0024 79°F	bmoh	lots of seco	le -> 500	cer games, playing paus	ed for	planes, event well
Period		11	# Automobile	0	# Médium Truck	0	# Heavy Truck
Time	17:22	0	# Bus	0	# Motorcycle	D	# Airplane/ Train
L1	73.6	L50	612 61.3	Lmin	58.0	Leq	63.5
L10	64.8 641.9	L90	59.4 59.5		80.3	Lpeak	
Note: \	0027 78°F (	tunala	Collegame			alme	

Location	10 11 11 11 11 11 11 11 11 11 11 11 11 1		
Location	H. HOOVER Promenade by	UN Ave & Ave of Commerce	# Site   5'
Fauinment /	Meter SN: 2384814	Date: 7/26/11	Observer:
Equipment / Calibration Info	Mic SN: 2385722	Date: 7/26/11	Christian
Calibration IIIIO	Calib SN: 1800102	Date: 7/26/11	TCHUSHAN

See previous drawing

Period				# Automobile		# Medium Truck		# Heavy Truck
Time	19:03			# Bus		# Motorcycle		# Airplane/ Train
L1		71.3	L50	62.0	Lmin	58.6	Leq	63.6
L10	65.8		L90	60.0 60il	Lmax	767	Lpeak	
Note: √	0030	76°F	, 4mo					
Period				# Automobile		# Medium Truck		# Heavy Truck
Time				# Bus		# Motorcycle		# Airplane/ Train
L1			L50		Lmin		Leq	
L10			L90		Lmax		Lpeak	
Note:					***	***************************************		
Period				# Automobile		# Medium Truck		# Heavy Truck
Time				# Bus		# Motorcycle		# Airplane/ Train
L1			L50		Lmin		Leq	
L10			L90		Lmax		Lpeak	
Note:								
Period				# Automobile		# Medium Truck		# Heavy Truck
Time				# Bus		# Motorcycle		# Airplane/ Train
L1		,	L50		Lmin		Leq	
L10			L90		Lmax		Lpeak	
Note:				*		***	- *	

Project Name	USTA-	Tennis Center			Date	8/31/11
Location	UN AVE h		18 8	GCP	# Site	6
Causia as a mt /		N: 2384814		: 7/26/11	Observ	/er:
Equipment /	Mic S	V: 2385722	Date	= 7/26/11		
Calibration Info	Calib S	V: 2688762	Date	8/3/11		hristian
Plan View			*			
					1	a)
}					1	outance
a /				*1		હું
3 1					A	+ 1
2					)	$\delta$
.9						
5						-
4						
Ave of Science						GCP
B						UCF
4		UN A.				
		OIA W	re			
$\overline{}$						
			$\hat{\mathbf{x}}$			
			9			
		37				
/						
Period	19	# Automobile	0	# Medium Truck	0	# Heavy Truck
Time   13:42		# Bus	0	# Motorcycle	0	# Airplane/ Trair
1 69.2	(f1.4 L50	62.2 62.3	Lmin	58.4	Leq	63.2
L10 64.6	64.8 L90	61.2	Lmax	76.2	Lpeak	
Note: \0006	passed for	planes & tour	namen	t vehicles		
Period	62	# Automobile	0	# Medium Truck	0	# Heavy Truck
Time 17:48	D	# Bus	0	# Motorcycle	0	# Airplane/ Trair
L1 67.6	L50	622	Lmin	58.8	Leq	629
1 67.6 10 64.8	64.9 L90	60.660,7	Lmax	75.2	Lpeak	
Vote:\0012	passed for	planes deve	10	nicles		
Period P	,	# Automobile		# Medium Truck		# Heavy Truck
Time		# Bus		# Motorcycle		# Airplane/ Train
_1	L50		Lmin		Leq	
_10	L90		Lmax		Lpeak	
Note:			•			
Period		# Automobile	T	# Medium Truck		# Heavy Truck
Гime		# Bus	<b>†</b>	# Motorcycle		# Airplane/ Trair
	L50	1	Lmin		Leg	" / " pictro/ Trail
_1 I					1-04	4
_1	L90		Lmax		Lpeak	

B						
Project Name	USTA T	ennis Stadium			Date	9/3/11
Location	UNAve	btw GCP\$		of Science	# Site	16
Equipment /		1: 2384814	Date		Obser\	
Calibration Info		1: 2385722	Date			nristian
Calibration tillo	Calib SN		Date			111271001
Plan View						
(	See a seul	as davina				
(	see previ	ious drawing	)			
Period	21	# Automobile	0	# Medium Truck		# Heavy Truck
Time (2:16		# Bus				
	0 150		D	# Motorcycle	0	# Airplane/ Train
L1 71.8 77		63.2	Lmin	60.5	Leq	64.4
L10 65.4	L90	620 62.1	Lmax	78.1	Lpeak	
	82°F, Zmp		<u>c phre</u>			La company
Period	15	# Automobile	0	# Medium Truck	0	# Heavy Truck
Time 14:04	0	# Bus	0	# Motorcycle	D	# Airplane/ Train
L1 66.2 (d	L50	622 62.4	Lmin	100.	Leq	62.7
	3.4 L90	61.4	Lmax	68.1	Lpeak	
Note: \0022 8	20F, 3mpt	1				
Period	33	# Automobile	6	# Medium Truck	0	# Heavy Truck
Time 16:12	0	# Bus	D	# Motorcycle	D	# Airplane/ Train
	7.4 L50	63.8	Lmin	61.8	Leq	64.2
	5,5 L90	628 629	Lmax	6.4	Lpeak	
LIU DESIGNATION				- <del> </del>		•
	186E 7	^				
Note: \0025 -	190F 3mp		ΙΛ	# Medium Truck		# Heavy Truck
Note: \0025 7	19°F, 3mp	# Automobile	0	# Medium Truck	0	# Heavy Truck
Note: \0025	19°F, 3mp	# Automobile # Bus	0	# Motorcycle	0	# Airplane/ Train
Note: \0025 7 Period   Time \17:57	9°F 3mp 0 L50	# Automobile # Bus 63.5 63.8	D Lmin	# Motorcycle	Leq	
Note: \0025 7 Period   Time \17:57 -1 72.2 -10 \(66.4	19°F, 3mp	# Automobile # Bus 63.5 63.8	0	# Motorcycle	0	# Airplane/ Train

# NOISE MONITORING FIELD DATA SHEET AKRF, Inc.

Project Name	UST7	A Tennis Studium	Date   9/3/1/	
Location	UNA	re btw Ave of S	cience \$6CP	# Site 6
Equipment / Calibration Info	Meter	SN: 2384814	Date: 7/26/11	Observer:
	Mic	SN: 2385722	Date: 7/26/11	Christian
	Calib	SN: 1800102	Date: 7/26/1	Christian
Plan View			5 8	

See previous drawing

Period		25	# Automobile	0	# Medium Truck	0	# Heavy Truck
Time	19:34	0	# Bus	0	# Motorcycle	0	# Airplane/ Train
L1	68.4	L50	63.0	Lmin	60,5	Leq	63.6
L10	64.6	L90	62.0	Lmax	73.5	Lpeak	
Note: \	0031 75	OF. IN	uph				
Period			# Automobile		# Medium Truck		# Heavy Truck
Time			# Bus		# Motorcycle		# Airplane/ Train
L1		L50		Lmin		Leq	
L10		L90		Lmax		Lpeak	
Note:	****						
Period			# Automobile		# Medium Truck		# Heavy Truck
Time			# Bus		# Motorcycle		# Airplane/ Train
L1		L50		Lmin		Leq	
L10		L90		Lmax		Lpeak	
Note:							
Period			# Automobile	1	# Medium Truck		# Heavy Truck
Time			# Bus		# Motorcycle		# Airplane/ Train
L1		L50		Lmin		Leg	
L10		L90		Lmax		Lpeak	
Note:		(t	*	•			

Decinal Massa	Luca	7 7 7			ID-4-	T = I= T.
Project Name	USTA	Tennis Center			Date	8/31/11
Location	Grands			=/_/	# Site	1 7
Equipment /	Meter S	SN: 2384814	Date	7/26/11	Observ	er:
Calibration Info	Mic S	SN: 238.5722	Date	7/26/11		vistian
	Calib	SN: 2688762	Date	8/3/11		Marian
Plan View	Sect	Tennis 50' L	Players Entrance	+	S	
David		[# A	1	T# Ma dissa Tassala		1411
Period Id. 71		# Automobile		# Medium Truck		# Heavy Truck
Time (9:3)		# Bus	1!	# Motorcycle		# Airplane/ Train
L1 849	L50	<u> 65.6</u>	Lmin	57.9	Leq	73.5
L10 77.1	L90	61.0	Lmax	88.4	Lpeak	
		Tu A		[### # = -		Tu = = =
Period		# Automobile	-	# Medium Truck		# Heavy Truck
Time 21:10	<del></del>	# Bus	1	# Motorcycle		# Airplane/ Train
L1 929	L50	67.1	Lmin	56.3	Leq	81.5
L10 861	L90	600	Lmax	101.1	Lpeak	
Note: \0016						
Period		# Automobile		# Medium Truck		# Heavy Truck
Time		# Bus		# Motorcycle		# Airplane/ Train
L1	L50		Lmin		Leq	
L10	L90		Lmax		Lpeak	
Note:				4.	7-3	
			T	# Medium Truck		# Heavy Truck
		# Automobile				
Period		# Automobile				
Period Time	1.50	# Automobile # Bus	I min	# Motorcycle	l o a	# Airplane/ Train
Period Time L1	L50		Lmin		Leq	
Period Time	L50 L90		Lmin Lmax		Leq Lpeak	



ISO 17025: 2005, ANSI/NCSL Z540:1994 Part 1 ACCREDITED by NVLAP (an ILAC and APLAC signatory)



NVLAP Lab Code: 200625-0

## Calibration Certificate No.24335

Instrument:

**Sound Level Meter** 

Model:

2260

Manufacturer:

Brüel and Kjær

Serial number: Tested with:

2384814

Microphone 4189 s/n 2385722

Preamplifier ZC0026

Type (class):

Customer:

AKRF, Inc.

Tel/Fax:

212-696-0670 / 212-213-3191

Date Calibrated: 7/26/2011 Cal Due: Sent

Received X

In tolerance: Out of tolerance:

See comments:

Address:

Contains non-accredited tests: Yes X No

Calibration service: \_\_ Basic X Standard

440 Park Avenue South, 7th Floor New York, NY 10016

#### Tested in accordance with the following procedures and standards:

Calibration of Sound Level Meters, Scantek Inc., 06/07/2005 SLM & Dosimeters - Acoustical Tests, Scantek Inc., 06/15/2005

#### Instrumentation used for calibration: Nor-1504 Norsonic Test System:

Instrument - Manufacturer	Description	S/N	Cal. Date	Traceability evidence	Cal. Due	
instrument - Manufacturer	Description	3/N	Cal. Date	Cal. Lab / Accreditation	Cal. Due	
483B-Norsonic	SME Cal Unit	25747	Jan 4, 2011	Scantek, Inc./ NVLAP	Jan 4, 2012	
DS-360-SRS	Function Generator	61646	Nov 13, 2009	ACR Env. / A2LA	Nov 13, 2011	
34401A-Agilent Technologies	Digital Multimeter	MY41022043	Nov 17, 2010	ACR Env. / A2LA	Nov 17, 2011	
DPI 141-Druck	Pressure Indicator	790/00-04	Dec 13, 2010	ACR Env. / A2LA	Dec 13, 2012	
HM30-Thommen	Meteo Station	1040170/3963 3	Jun 26, 2010	ACR Env. / A2LA	Dec 26, 2011	
PC Program 1019 Norsonic	Calibration software	v.5.0	Validated July 2009	•		
1251-Norsonic	Calibrator	30878	Dec 7, 2010	Scantek, Inc./ NVLAP	Dec 7, 2011	

Instrumentation and test results are traceable to SI (International System of Units) through standards maintained by NIST (USA) and NPL (UK).

#### **Environmental conditions:**

Temperature (°C)	Barometric Pressure (kPa)	Relative Humidity (%)
23.7 °C	99.532 kPa	54.1 %RH

Calibrated by	Kristen van Otterloo	Checked by	Mariana Buzduga		
Signature	Trum Ou Colo	Signature	lub		
Date	712612011	Date	7/27/2011		

Calibration Certificates or Test Reports shall not be reproduced, except in full, without written approval of the laboratory. This Calibration Certificate or Test Reports shall not be used to claim product certification, approval or endorsement by NVLAP, NIST, or any agency of the federal government.

Document stored as: Z:\Calibration Lab\SLM 2011\BNK2260\_2384814\_M2.doc

Page 1 of 2

## Results summary: Device complies with following clauses of mentioned specifications:

CLAUSES <sup>1</sup> FROM IEC/ANSI STANDARDS REFERENCED IN PROCEDURES:	MET <sup>2,3</sup>	NOT MET	MEASUREMENT EXPANDED UNCERTAINTY (coverage factor 2) [dB]
IEC 60651/ANSI S1.4:		1,100	
Input Amplifier Test: Gain Step test/Amplifier Setting (# 6.3/5.3)	X		0.15
Level Linearity Test (#7.9/ 6.9)	Х		0.15
Weighting Network Tests: A, C, Lin network (#7.2.1/ 6.2.1-electrical test)	X		0.15
Overload Detector Test: A-network (#9.3.1/8.3.1)	X		0.15
F/S/I/Peak Test: Steady State Response (#7.4/ 6.4)	X		0.15
Fast and Slow Overshoot Test (# 8.4.1)	X		0.15
Fast-Slow Test: Single Sine Wave Burst (9.4.1&9.4.3/8.4.1 & 8.4.3)	X		0.15
Impulse Test: Continuous Sine Wave Burst (#7.3/ 6.3)	X		0.15
Impulse Test: Single Sine Wave Burst (#7,3/ 6.3)	X		0.15
Peak Detector Tests: single square wave burst (# 9.4.4/8.4.4)	X		0.15
RMS Detector Test: Continuous Sine Wave Burst (#9.4.2/8.4.2)	X		0.15
RMS Detector Test: Crest Factor Test (#9.4.2/ 8.4.2)	X		0.15
IEC60804/ANSI S1.43	The way	TE C	no suga a nila
Level linearity Test (# 9.3.3/8.3.3)	X		0.15
Time Averaging Test (#9.3.2/ 8.3.2) (Leq and LE)	X		0.15/0.17
Acoustical Test: Accuracy at selected frequencies	X		0.15
Global Acoustical response: Summation (w/ actuator) (#5)	Х		0.2-0.5
Filter Test: Octave Filters	Х		0.2
Filter Test: 1/3 Octave Filters	X		0.2

<sup>1</sup> The results of this calibration apply only to the instrument type with serial number identified in this report.

Comments: The instrument was tested and met all specifications found in the referenced procedures.

Note: The instrument was tested for the parameters listed in the table above, using the test methods described in the listed standards. All tests were performed around the reference conditions. The test results were compared with the manufacturer's or with the standard's specifications, whichever are larger. Compliance with any standard cannot be claimed based solely on the periodic tests.

Tests made with the following attachments to the instrument:

X	Microphone 4189 s/n 2385722 for acoustical test
X	Preamplifier ZC0026 for all tests
X	Other: line adaptor ADP005 (18pF) for electrical tests

Measured Data: in Test Report # 24335 of 12 + 1 pages.

Place of Calibration: Scantek, Inc. 6430 Dobbin Road, Suite C Columbia, MD 21045 USA

Ph/Fax: 410-290-7726/ -9167 callab@scantekinc.com

<sup>&</sup>lt;sup>2</sup> Parameters are certified at actual environmental conditions.

<sup>&</sup>lt;sup>3</sup> The tests marked with (\*) are not covered by the current NVLAP accreditation.

## Calibration Summary of Test Report No.:24335

Brüel and Kjær Type: 2260 Serial no: 2384814

Customer:

AKRF, Inc.

Address:

440 Park Avenue South, 7th Floor New York, NY 10016

Contact Person:

Christian Thompson

Phone No.:

212-696-0670

Fax No.:

212-090-0070

eMail:

cthompson@akrf.com

Instrument software version: 1.2

Microphone:

Brüel & Kjær

Type: 4189

Serial no: 2385722

Sens:-25.8dB

Preamplifier Calibrator:

Brüel & Kjær Brüel and Kjær Type: ZC0026 Type: 4231 Serial no:

Serial no: 1800102

Level:93.94dB

Measured with Preamplifier

#### Measurement Results:

Calibration of sound level meter - ANSI S1.4 Clause 3.2 Passed Input Amplifier Test: Gain Test / Attenuator setting - According to ANSI S1.4-1983 Clause 5.3 Passed Level Linearity Test - According to ANSI S1.4-1983, Clause 6.9 & 6.10 Passed Weighting Network Test: A Network - ANSI S1.4-1983 Clause 8.2.1 Passed Weighting Network Test: C Network - According to ANSI S1.4-1983 Clause 8.2.1 Passed Weighting Network Test: Linear Network - According to ANSI S1.4-1983 Clause 8.2.1 Passed Overload Detector Test: A-Network - ANSI S1.4-1983 Clause 8.3.1 Passed F/S/I/Peak Test: Steady State Response - According to ANSI S1.4 1983 Clause 6.4 Passed Fast-Slow Test: Overshoot test - According to ANSI S1.4 1983 Clause 8.4.1 Passed Fast-Slow Test: Single Sine Wave Burst - ANSI S1.4 1983 Clause 8.4.1 & 8.4.3 Passed Impulse Test: Continuous Sine Wave Burst - According to ANSI S1.4 1983 Clause 8.4.3 Passed Impulse Test: Single Sine Wave Burst - According to ANSI S1.4 1983 Clause 8.4.1 & 8.4.3 Passed Peak Detector Test, single square wave burst - According to ANSI S1.4 1983 Clause 8.4.4 Passed RMS Detector Test: Crest Factor Test - According to ANSI S1.4-1983 Clause 8.4.2 Passed RMS Detector Test: Continuous Sine Wave Burst - According to ANSI S1.4-1983 Clause 8.4.2 Passed Time Averaging Test: Averaging Functions - ANSI S1.43 Clause 9.3.2 Passed Linearity Test - ANSI S1.43 Clause 9.3.3 Passed Filter Test 1/1octave: Relative attenuation - IEC 61260, Clause 4.4 & #5.3 Passed Filter Test 1/3octave: Relative attenuation - IEC 61260, Clause 4.4 & #5.3 Passed Summation of acoustic tests - ANSI S1.4 Clause 5 using Actuator Passed

Environmental conditions:

Pressure:

Temperature:

Relative humidity:

99.532 kPa

23.7 °C

54.1 %RH

Date of calibration: 7/26/2011 Date of issue: 7/26/2011 Supervisor: Mariana Buzduga Measurements performed by:

Kristen van Otterloo

Software version: 5.2a

Scantek. Inc.

6430 Dobbin Rd., Suite C, Columbia, MD 21045 Ph: 410-290-7726 eMail: callab@scantekinc.com

## Test Report No.:24335

Manufacturer:

Brüel and Kjær

Instrument type:

2260

Serial no:

2384814

Customer:

AKRF, Inc.

Department:

Order No:

**Contact Person:** 

**Christian Thompson** 

Address:

440 Park Avenue South, 7th Floor New York, NY 10016

Environmental conditions:

Pressure:

99.532 kPa

Temperature:

23.7 °C

Relative humidity:

54.1 %RH

Supervisor Engineer Mariana Buzduga Kristen van Otterloo

Date:

7/26/2011

### **Measurement Results:**

#### Calibration of sound level meter - ANSI S1.4 Clause 3.2

```
Reference Calibrator: WSC4 - NOR1251-30878
Reference calibrator level: 113.97
Before calibration:
  Environmental corrections: 0.00
  Other corrections: 0.1
  Notional level: 114.07
Reference calibrator level before calibration: 114.1
After calibration:
  Environmental corrections: 0.00
  Other corrections: 0.1
  Notional level: 114.07
Reference calibrator level after calibration: 114.1
Associated Calibrator: Brüel and Kjær - 4231 - 1800102
Associated calibrator level: 93.94
Initial level check:
  Environmental corrections before calibration: 0.00
  Other corrections: 0.1
  Notional level: 94.04
Indicated level before calibration: 94.0
Final level statement:
  Environmental corrections after calibration: 0.00
  Other corrections: 0.1
  Notional level: 94.04
Indicated level after calibration: 94.0
This value shall be used for adjusting the sound level meter in the future.
Test Passed
```

## Input Amplifier Test: Gain Test / Attenuator setting - According to ANSI S1.4-1983 Clause 5.3

The level range control is tested in 10 dB steps. The SLM is set to the reference range and the signal generator is adjusted to give a reading equal to the reference level (Normally 94 dB.) The SLM range control is then set to the least sensitive range, and the generator level is set to 10 dB below full scale. The level range control is then decreased in 10 dB steps until the most sensitive range is reached. The generator level is adjusted accordingly.

Ful1	Ref.	Meas.	Tol.	Error	
Scale	Value	Value	norm	Value	
(dB)	(dB)	(dB)	(dB)	(dB)	
Measur	ed at 31.5	Hz			
130	114.0	114.0	0.5	0.0	P
120	104.0	104.0	0.5	0.0	Ρ
110	94.0	94.0	0.5	0.0	P
100	84.0	84.0	0.5	0.0	Ρ
90	74.0	74.0	0.5	0.0	Р
80	64.0	64.0	0.5	0.0	Ρ
70	54.0	54.0	0.5	0.0	Ρ
Measur	red at 1000	Hz			
130	114.0	113.9	0.5	-0.1	Ρ
120	104.0	104.1	0.5	0.1	Р

Full	Amplifier Ref.	Meas.	Tol.	Error	setting	-	According	to	ANSI	S1.4-1983	Clar
Scale		Value	norm	Value							
(dB)	(dB)	(dB)	(dB)	(dB)							
110	94.0	94.0	0.5	0.0 P							
100	84.0	84.0	0.5	0.0 P							
90	74.0	74.0	0.5	0.0 P							
80	64.0	64.0	0.5	0.0 P							
70	54.0	54.0	0.5	0.0 P							
Measu	red at 8000	Hz									
130	114.0	114.0	0.5	0.0 P							
120	104.0	104.0	0.5	0.0 P							
110	94.0	94.0	0.5	0.0 P							
100	84.0	84.0	0.5	0.0 P							
90	74.0	74.0	0.5	0.0 P							
80	64.0	64.0	0.5	0.0 P							
70	54.0	54.0	0.5	0.0 P							
Test	Passed										

#### Level Linearity Test - According to ANSI S1.4-1983, Clause 6.9 & 6.10

The SLM is set to the reference range and the signal generator is adjusted to give a reading equal to the reference level (Normally 94dB.) The test signal is increased to give a reading equal to FSD. The generator is lowered in 1 dB step until the lower limit of the reference range is reached. The Fast SPL value is measured. The error is measured relative to 94 dB, in the last one dB step and the max error in a floating 10 dB window.

Nom.	Meas.	Tolerance	Error	Error	Error	
Value	Value	limits	in the	the	Rel. t	
(dB)	/db/	(dB)	last 1dB (dB)	st 10dB (dB)	ref. l (dB)	ever
Measured at	(dB)	(ub)	(QB)	 ,ub)	(ub)	
94.0	93.9	0.3/1.0/1.0	0.0 P	0.0 P	-0.1	P
95.0	95.0	0.3/1.0/1.0	0.0 F	0.0 F	0.0	P
100.0	100.0	0.3/1.0/1.0	0.0 P	0.1 P	0.0	P
105.0	105.0	0.3/1.0/1.0	0.0 P	0.1 P	0.0	P
106.0	106.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0	P
107.0	106.9	0.3/1.0/1.0	-0.1 P	0.0 P	-0.1	P
108.0	107.9	0.3/1.0/1.0	0.0 P	0.1 P	-0.1	P
109.0	108.8	0.3/1.0/1.0	-0.1 P	0.1 P	-0.2	P
94.0	94.0	0.2/0.4/0.7	0.0 P	0.2 P	0.0	P
90.0	90.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0	P
85.0	85.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0	P
80.0	80.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0	P
75.0	75.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0	P
70.0	70.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0	P
65.0	65.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0	P
60.0	60.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0	P
55.0	55.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0	P
50.0	50.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0	P
45.0	45.1	0.2/0.4/0.7	0.1 P	0.1 P	0.1	P
40.0	40.0	0.2/0.4/0.7	-0.1 P	0.1 P	0.0	P
37.0	37.1	0.2/0.4/0.7	0.1 F	0.1 P	0.1	P
36.0	36.1	0.2/0.4/0.7	0.0 P	0.1 P	0.1	P
35.0	35.1	0.2/0.4/0.7	0.0 F	0.1 P	0.1	P
34.0	34.2	0.2/0.4/0.7	0.1 F	0.2 P	0.2	P
Measured at		0.2/0.1/0.1	0.1 1		0,2	-
abarca ac	1000 112					

Level Linear Nom. Value (dB)	Test Meas. Value	- According to Tolerance limits (dB)	ANSI S1.4-19 Error in the last 1dB (dB)	83, Clause 6.9 8 Max Error in the last 10dB (dB)	Error Rel. to ref. level (dB)
94.0	94.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
95.0	95.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
100.0	100.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
105.0	105.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
106.0	106.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
	107.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
107.0	108.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
108.0			0.0 P	0.0 P	0.0 P
109.0	109.0	0.3/1.0/1.0			0.0 P
94.0	94.0	0.2/0.4/0.7	0.0 P	0.0 P	
90.0	90.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
85.0	85.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
80.0	80.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
75.0	75.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
70.0	70.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
65.0	65.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
60.0	60.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
55.0	55.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
50.0	50.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
45.0	45.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
40.0	40.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
37.0	37.1	0.2/0.4/0.7	0.1 P	0.1 P	0.1 P
36.0	36.1	0.2/0.4/0.7	0.0 P	0.1 P	0.1 P
35.0	35.1	0.2/0.4/0.7	0.0 P	0.1 P	0.1 P
34.0	34.2	0.2/0.4/0.7	0.1 P	0.2 P	0.2 P
Measured at	8000 Hz				
94.0	94.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
95.0	95.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
100.0	100.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
105.0	105.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
106.0	106.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
107.0	107.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
108.0	108.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
109.0	109.0	0.3/1.0/1.0	0.0 P	0.0 P	0.0 P
94.0	94.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
90.0	90.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
85.0	85.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
80.0	80.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
75.0	75.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
70.0	70.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
65.0	65.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
60.0	60.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
55.0	55.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
50.0	50.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
45.0	45.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
40.0	40.0	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
	37.1	0.2/0.4/0.7	0.0 P	0.0 P	0.0 P
37.0 36.0	36.1	0.2/0.4/0.7	0.1 P	0.1 P	0.1 P
	35.1	0.2/0.4/0.7	0.0 P	0.1 P 0.1 P	0.1 P
35.0 34.0	34.2	0.2/0.4/0.7	0.0 P 0.1 P	0.1 P 0.2 P	0.1 P
Test Passed	34.2	0.2/0.4/0./	V.1 P	U.Z F	V.2 F
ical rassed					

#### Weighting Network Test: A Network - ANSI S1.4-1983 Clause 8.2.1

The frequency weighting networks test is performed with the SLM set to reference range. Reference frequency is 1000 Hz. The test signal is adjusted to give a full scale indication at 1000 Hz. The frequency of the test signal is increased in 1/3 octave steps from 10 Hz to 20 kHz. All applicable networks can be tested (I.E. A, B and C).

Freq							
	Ref.	Measured	non	rm		Error	Result
		value	Upp.	Low.		Value	
(Hz)	(dB)	(dB)	(dB)	(dB)		(dB)	
31.6	68.6	68.8	1.5	-1.5		0.2	P
63.1	81.8	81.8	1.0	-1.0		0.0	P
125.9	91.9	91.9	1.0	-1.0		0.0	P
251.2	99.4	99.4	1.0	-1.0		0.0	P
501.2	104.8	104.8	1.0	-1.0		0.0	P
1000.0	108.0	108.0	1.0	-1.0	160	0.0	P
1995.3	109.2	109.2	1.0	-1.0		0.0	P
3981.1	109.0	109.0	1.0	-1.0		0.0	P
7943.3	106.9	106.9	1.5	-3.0		0.0	P
12589.3	103.7	103.6	3.0	-6.0		-0.1	P
Test Passed							

Test Passed

#### Weighting Network Test: C Network - According to ANSI S1.4-1983 Clause 8.2.1

The frequency weighting networks test is performed with the SLM set to reference range. Reference frequency is 1000 Hz. The test signal is adjusted to give a full scale indication at 1000 Hz. The frequency of the test signal is increased in 1/3 octave steps from 10 Hz to 20 kHz. All applicable networks can be tested (I.E. A, B and C).

Freq	•		Toles	rance	•	
rred	~ 6					<b>.</b>
	Ref.	Measured	no	rm	Error	Result
		value	Upp.	Low.	Value	
(Hz)	(dB)	(dB)	(dB)	(dB)	(dB)	
31.6	105.0	105.0	1.5	-1.5	0.0	P
63.1	107.2	107.2	1.0	-1.0	0.0	P
125.9	107.8	107.8	1.0	-1.0	0.0	P
251.2	108.0	108.0	1.0	-1.0	0.0	P
501.2	108.0	108.0	1.0	-1.0	0.0	P
1000.0	108.0	108.0	1.0	-1.0	0.0	P
1995.3	107.8	107.8	1.0	-1.0	0.0	P
3981.1	107.2	107.2	1.0	-1.0	0.0	P
7943.3	105.0	105.0	1.5	-3.0	0.0	P
12589.3	101.8	101.7	3.0	-6.0	-0.1	P
Tout Daggod						

Test Passed

#### Weighting Network Test: Linear Network - According to ANSI S1.4-1983 Clause 8.2.1

The frequency weighting networks test is performed with the SLM set to reference range. Reference frequency is 1000 Hz. The test signal is adjusted to give a full scale indication at 1000 Hz. The frequency of the test signal is increased in 1/3 octave steps from 10 Hz to 20 kHz. All applicable networks can be tested (I.E. A, B and C).

Freq			Tole:	rance			
_	Ref.	Measured	no:	rm	E	rror	Result
		value	Upp.	Low.	V	alue	
(Hz)	(dB)	(dB)	(dB)	(dB)		(dB)	
31.6	108.0	108.0	1.5	-1.5		0.0	P
63.1	108.0	108.0	1.0	-1.0		0.0	P
125.9	108.0	108.0	1.0	-1.0		0.0	P
251.2	108.0	108.0	1.0	-1.0		0.0	P
501.2	108.0	108.0	1.0	-1.0	1921	0.0	P
1000.0	108.0	108.0	1.0	-1.0		0.0	P
1995.3	108.0	108.0	1.0	-1.0		0.0	P
3981.1	108.0	108.0	1.0	-1.0		0.0	P
7943.3	108.0	108.0	1.5	-3.0		0.0	P
12589.3	108.0	107.9	3.0	-6.0		-0.1	P
Test Passed							

#### Overload Detector Test: A-Network - ANSI S1.4-1983 Clause 8.3.1

The SLM is set to A-weighted and the least sensitive range setting. A sine wave of 1000 Hz is applied to the SLM with an amplitude that gives a reading 5 dB less than the maximum level the SLM is designed to measure. The test signal is lowered in 1/3 octave frequency steps until 20 Hz is reached. The amplitude of the test signal is simultaneously increased corresponding to the inverse of the A-weighting curve. The overload indication shall be turned on before the measured Slow SPL value is deviating more than one dB from the initial value measured at 1000 Hz.

Freq.	Level	Meas.	Tol	•	Error		Error
	Increase	Value	Upp.	Low.	Value		Code
(Hz)	(dB)	(dB)	(dB	.)	(dB)		
The Reference	ce range :	is used	for th	is test	because	of	expected high signal amplitude.
1000.0	0.0	105.0	-1.0	1.0	0.0		P No overload
794.3	0.8	105.0	-1.0	1.0	0.0		P No overload
631.0	1.9	105.0	-1.0	1.0	0.0		P No overload
501.2	3.2	105.0	-1.0	1.0	0.0		P No overload
398.1	4.8	105.0	-1.0	1.0	0.0		P No overload
316.2	6.6	105.0	-1.0	1.0	0.0		P Overload
Test Passed							

#### F/S/I/Peak Test: Steady State Response - According to ANSI S1.4 1983 Clause 6.4

A continuous sine wave is applied and adjusted to give an indication of 94.0 dB with time constant F(ast). The instrument is set to S(low) and I(mpulse), if applicable. The indication shall not differ more than 0.1 dB for type 0,1,2 instruments and 0.2 for type 3 instruments.

Time	Norm	Measured	Tol.	Error
Const.	Value	Value	limit	Value
	(dB)	(dB)	(dB)	(dB)
Fast	94.0	94.0	0.1	0.0 P
Slow	94.0	94.0	0.1	0.0 P

F/S/I/Peak Test: Steady State Response - According to ANSI S1.4 1983 Clause 6.4 Time Norm Measured Tol. Error Const. Value Value limit Value (dB) (dB) (dB) (dB) 94.0 94.0 0.1 0.0 P Imp. Test Passed

#### Fast-Slow Test: Overshoot test - According to ANSI S1.4 1983 Clause 8.4.1

The overshoot is tested by applying a sine wave that step (sudden increase) in amplitude by 20 dB. The steady end response shall give a signal 4 dB below the upper limit of primary indicator range. The difference between the maximum value and the end value tells the overshoot. Both F(ast) and S(low) time constants are tested.

Time	Ref	Measured	Tolerance	'Overshoot	Error
Const.	Value	Value	norm		
	(dB)	(dB)	(dB)	(dB)	
Fast	89.0	89.0	1.1	0.0	P
Slow	89.0	89.0	1.6	0.0	P
Fast	49.0	49.0	1.1	0.0	P
Slow	49.0	48.6	1.6	-0.4	P
Test Passed	l				

#### Fast-Slow Test: Single Sine Wave Burst - ANSI S1.4 1983 Clause 8.4.1 & 8.4.3

A continuous sine wave is applied to the SLM and adjusted to give an indication 4 dB below upper limit of the primary indicator range. Then onset transient characteristics are tested using a single sine wave burst with an amplitude equal to the continuous signal and a duration of T(ms). The test is repeated at a level 24 dB below the upper limit of the primary indicator range.

	,	_		_		
Time	Burst	Ref.	Measured	Toleran	ce Error	
Constant	Duration	Value	Value	Value	Value	
	(ms)	(dB)	(dB)	(dB)	(dB)	
Fast	200.0	88.0	88.0	1.0 -1	.0 0.0	P
Slow	500.0	84.9	84.9	1.0 -1	.0 0.0	P
Fast	200.0	48.0	48.0	1.0 -1	.0 0.0	P
Slow	500.0	44.9	44.9	1.0 -1	.0 0.0	P
Test Passed						

#### Impulse Test: Continuous Sine Wave Burst - According to ANSI S1.4 1983 Clause 8.4.3

A continuous sine wave signal is adjusted to give a FSD indication at the reference range. A continuous sine wave burst with the same amplitude as the continuous signal is used as a test signal. The repetition rate of the burst is 100 Hz, 20 Hz, and 2 Hz. The I(mpulse) indication is measured at various repetition rates of the burst signal (100 Hz, 20 Hz, and 2 Hz). At a repetition rate of 2 Hz the signal amplitude is increased by 5dB. The indication shall increase respectively with a tolerance of ±1.0 dB. The test is repeated 20 dB below FSD. The flattest weighting network available is used for this test.

Repetition	Ref.	Measured	Tolerance	Error
Frequency	Value	Value	norm	Value
(Hz)	(dB)	(dB)	(dB)	(dB)
100	90.3	90.2	1.0	-0.1 P

Impulse Test: Continuous Sine Wave Burst - According to ANSI S1.4 1983 Clause 8.4.3 Repetition Ref. Measured Tolerance Error

Repeti Freque (Hz)		Ref. Value (dB)	Measured Value (dB)	Tolerance norm (dB)	Erro Valu (dB)	
20		85.4	85.4	2.0	0.0	P
2		84.2	84.1	2.0	-0.1	P
2	+5dB	89.1	89.1	1.0	0.0	P
100		50.3	50.0	1.0	-0.3	P
20		45.4	43.7	2.0	-1.7	P
2		44.2	44.2	2.0	0.0	P
2	+5dB	49.2	49.1	1.0	-0.1	P

Test Passed

Impulse Test: Single Sine Wave Burst - According to ANSI S1.4 1983 Clause 8.4.1 & 8.4.3

Burst Duration (ms)	Ref. Value (dB)	Measured Value (dB)	Tolerance norm (dB)	Error Value (dB)	
20.0	89.4	89.3	1.5	-0.1	P
5.0	84.2	84.2	2.0	0.0	P
2.0	80.4	80.4	2.0	0.0	P
2.0 +10dB	90.4	90.3	1.0	-0.1	P
20.0	49.4	49.3	1.5	-0.1	P
5.0	44.2	44.1	2.0	-0.1	P
2.0	40.4	40.3	2.0	-0.1	P
2.0 +10dB	50.3	50.3	1.0	0.0	P
Test Passed					

Peak Detector Test, single square wave burst - According to ANSI S1.4 1983 Clause 8.4.4

Pulse	Pulse	Ref.	Measured	Tolerance	Error	
Duration	Polarity	Value	Value	Value		
	_	(dB)	(dB)	(dB)	(dB)	
10ms	+	112.0	112.9	2.0	0.9	P
0.1ms	+	112.0	112.0	2.0	0.0	Р
10ms	_	112.0	112.9	2.0	0.9	Р
0.1ms	_	112.0	112.2	2.0	0.2	P
10ms	+	92.0	92.9	2.0	0.9	P
0.1ms	+	92.0	92.0	2.0	0.0	P
10ms	-	92.0	92.8	2.0	0.8	P
0.1ms	-	92.0	92.0	2.0	0.0	Ρ

The results have been compensated for the impulse response of the C-weighting network. Test Passed

#### RMS Detector Test: Crest Factor Test - According to ANSI S1.4-1983 Clause 8.4.2

The SLM is set to reference range. A continuous square wave with CF=1 is applied and adjusted to give an indication 2 dB below upper limit of primary indicator range. The duration of the square wave pulses is kept constant at 200 µs and rise time less than 10µs. The RMS value of the signal is kept constant while the crest factor (CF) is increased from 1 to 10. The test is performed both for positive and negative going test signals.

Crest	Rei.	Meas.	TOI.		Error	
Factor	Value	Value	norm		Value	
	(dB)	(dB)	(dB)		(dB)	
Positive	Pulses					
3.0	91.0	90.9	0.5		-0.1	P
5.0	91.0	90.9	1.5		-0.1	P
10.0	91.0	90.9	1.5		-0.1	P
Negative	Pulses					
3.0	91.0	90.9	0.5	1911	-0.1	Р
5.0	91.0	90.9	1.5		-0.1	P
10.0	91.0	90.9	1.5		-0.1	P
Positive	Pulses					
3.0	51.0	50.9	0.5		-0.1	P
5.0	51.0	51.0	1.5		0.0	P
10.0	51.0	51.0	1.5		0.0	P
Negative	Pulses					
3.0	51.0	51.0	0.5		0.0	P
5.0	51.0	51.0	1.5		0.0	P
10.0	51.0	51.0	1.5		0.0	P
Test Pass	ed					

#### RMS Detector Test: Continuous Sine Wave Burst - According to ANSI S1.4-1983 Clause 8.4.2

The instrument is set to time constant Slow. A continuous sine wave (2kHz) is applied to the SLM and adjusted to give an indication 2 dB below upper limit of the primary indicator range. The signal is replaced by a sequence of tone bursts with a repetition rate of 40Hz. The RMS level of the signal is kept constant while the crest factor is increased from 1 to 10. Test signal: Continuous sine wave burst with repetition rate of 40Hz

Crest	Ref.	Meas.	Tolerance	Error	
Factor	Value	Value	norm	Value	
	(dB)	(dB)	(dB)	(dB)	
3	91.0	91.0	0.5	0.0	P
5	91.0	91.0	1.5	0.0	P
10	91.0	91.0	1.5	0.0	P
3	51.0	51.0	0.5	0.0	P
5	51.0	51.0	1.5	0.0	P
10	51.0	51.0	1.5	0.0	P

Test Passed

## Time Averaging Test: Averaging Functions - ANSI S1.43 Clause 9.3.2

The SLM is set to the reference range. The signal generator is adjusted to give a 4 kHz sine wave with an rms level equal to 20dB above the bottom end of the Linearity range. The sine wave is replaced by a sequence of tone burst with the same frequency. The burst duty factor (the distance between each burst) is increased, while the amplitude is increased to keep the same equivalent rms level. The measurement time is 100 sec for type 0 (and manually controlled) instruments and 10 sec for all other instruments.

Burst	Ref. T	oleránce	Value	Error		Value	Error	
Duration	Value	norm	(LeqA)	Value		(SEL)	Value	
(ms)	(dB)	(dB)	(dB)	(dB)		(dB)	(dB)	
1000.0	70.0	0.5	70.0	0.0	P	80.0	0.0	P
100.0	70.0	0.5	70.0	0.0	P	80.0	0.0	P
10.0	70.0	1.0	70.0	0.0	P	80.0	0.0	P
1.0	70.0	1.0	69.9	-0.1	P,	79.9	-0.1	P
2min	70.0	1.0	70.0	0.0	P	90.8	0.0	P

Test Passed

### Linearity Test - ANSI S1.43 Clause 9.3.3

Int.	Ref.	Meas.	Tolerand	ce Error		Meas.	Tolera	ance	Error	
Time	Value	Value	norm	Value		Value	norm		Value	
(sec.)	(dB)	(dB)	(dB)	(dB)		(dB)	(dB)		(dB)	
10	94.0	93.9	0.4	-0.1	P	103	. 9	0.4	-0.1	P
10	110.0	109.9	0.7	-0.1	P	119	. 9	0.7	-0.1	P
10	50.0	49.9	0.7	-0.1	P	59	.9	0.7	-0.1	P
Test Pas	ssed									

#### Filter Test 1/1octave: Relative attenuation - IEC 61260, Clause 4.4 & #5.3

Togt 1/1 ogt	ave filter X	- 2 fevert-	-79/3 282H=	class (	١
	Measured				
	L[dB]				
1000.00	44.0	0.0	46.0		
1995.26	63.2	0.0	65.5		
3981.07	87.0	0.0	90.0	P	
5623.41	104.1	103.5	105.7	P	
6130.56	107.0	106.9	108.2	P	
6683.44	107.9	107.6	108.2	P	
7286.18	108.0	107.8	108.2	P	
7943.28	108.0	107.9	108.2	P	
8659.64	108.0	107.8	108.2	P	
9440.61	108.0	107.6	108.2	P	
10292.0	107.3	106.9	108.2	P	
11220.2	104.7	103.5	105.7	P	
15848.9	87.1	0 0	90.0	P	
31622.8	.0	0.0	65.5	P	
63095.7	.0	0.0	46.0	P	
Test 1/1 oct	ave filter X	= 4 fexact=	=15848.932H	z class	0
Nominal	Measured	LoLim	HiLim	Result	
f[Hz]	L[dB]	[dB]	[dB]	[P/F]	
		0.0		P	
3981.07		0.0	65.5	P	
222101	,	- • •		_	

7943.28	85.7	0.0	90.0	P
11220.2	104.2	103.5	105.7	P
12232.1	107.2	106.9	108.2	P
13335.2	108.0	107.6	108.2	P
14537.8	108.0	107.8	108.2	P
15848.9	108.0	107.9	108.2	P
17278.3	108.0	107.8	108.2	P
18836.5	108.0	107.6	108.2	P
20535.3	107.6	106.9	108.2	P
22387.2	105.2	103.5	105.7	P
31622.8	<b>,</b> 0	0 0	90.0	P
63095.7	. 0	0.0	65.5	P
125893	. 0	0.0	46.0	P
Test Passed				

## Filter Test 1/3octave: Relative attenuation - IEC 61260, Clause 4.4 & #5.3

Test 1/3 oct	ave filter	X= 12 fexact	=16000.000	Hz clas:	s 0
Nominal	Measured	LoLim	HiLim	Result	
f [Hz]	L[dB]	[dB]	[dB]	[P/F]	
5212.50	42.3	0.0	46.0	P	
8479.30	60.9	0.0	65.5	P	
12349.0	85.2	0.0	90.0	P	
14254.4	104.3	103.5	105.7	P	
14709.1	107.3	106.9	108.2	P	
15152.4	107.9	107.6	108.2	P	
15583.0	108.0	107.8	108.2	P	
16000.0	108.0	107.9	108.2	P	
16428.1	108.0	107.8	108.2	P	
16895.0	108.0	107.6	108.2	P	
17404.2	107.3	106.9	108.2	P	
17959.4	104.3	103.5	105.7	P	
20730.4	84.8	0.0	90.0	P	
30191.2	. 0	0.0	65.5	P	
49112.7	. 0	0.0	46.0	P	
Test 1/3 oct	ave filter	X= 13 fexact		/Hz clas:	s 0
Nominal	Measured	LoLim	HiLim	Result	
f [Hz]	L[dB]	[dB]	[dB]	[P/F]	
6567.33	42.8	0.0	46.0	P	
10683.2	61.2	0.0	65.5	P	
15558.8	85.9	0.0	90.0	P	
17959,4	104.5	103.5	105.7	P	
18532.3	107.3	106.9	108.2	P	
19090.8	107.9	107.6	108.2	P	
19633.4	108.0	107.8	108.2	P	
20158.7	108.0	107.9	108.2	P	
20698.2	108.0	107.8	108.2	P	
21286.4	107.9	107.6	108.2	P	
21927.9	107.3	106.9	108.2	P	
22627.4	104.4	103.5	105.7	P	
26118.7	36.0	0.0	90 . 0	P	
38038.5	. 0	0.0	65.5	P	
61878.2	. 0	0.0	46.0	P	
Test Passed					

## Summation of acoustic tests - ANSI S1.4 Clause 5 using Actuator

The microphone data are measured using electrostatic actuator. SLM: A-Weighted results

SLM: A-Weight	ed results					
Freq.	SLM	Mic.	CR.	WS.	Tol.	Dev.
(Hz)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
31.5	-39.2	0.0	0.0		+-1.5	0.2
63	-26.2	0.0	0.0		+-1.5	0.0
125	-16.1	0.1	0.0		+-1.0	0.1
250	-8.6	0.1	0.0		+-1.0	0.1
500	-3.2	0.1	0.0		+-1.0	0.1
1 k	0.0	0.1	0.0		+-1.0	0.1
2 k	1.2	0.1	0.0		+-1.0	0.1
4 k	1.0	0.1	0.0		+-1.0	0.1
8 k	=1.1	-0.1	0.0		+1.5,-3	-0.1
12.5 k	-4.4	0.7	0.0		+3,-6	0.6
SLM: C-Weight	ed results					
Freq.	$\mathtt{SLM}$	Mic.	CR.	WS.	Tol.	Dev.
(Hz)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
31.5	-3.0	0.0	0.0		+-1.5	0.0
63	-0.8	0.0	0.0		+-1.5	0.0
125	-0.2	0.1	0.0		+-1.0	0.1
250	0.0	0.1	0.0		+-1.0	0.1
500	0.0	0.1	0.0		+-1.0	0.1
1 k	0.0	0.1	0.0		+-1.0	0.1
2 k	-0.2	0.1	0.0		+-1.0	0.1
4 k	-0.8	0.1	0.0		+-1.0	0.1
8 k	-3.0	-0.1	0.0		+1.5,-3	-0.1
12.5 k	-6.3	0.7	0.0		+3,-6	0.6
SLM: Lin resu	ılts					
Freq.	$\mathtt{SLM}$	Mic.	CR.	WS.	Tol.	Dev.
(Hz)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)
31.5	0.0	0.0	0.0		+-1.5	0.0
63	0.0	0.0	0.0		+-1.5	0.0
125	0.0	0.1	0.0		+-1.0	0.1
250	0.0	0.1	0.0		+-1.0	0.1
500	0.0	0.1	0.0		+-1.0	0.1
1 k	0.0	0.1	0.0		+-1.0	0.1
2 k	0.0	0.1	0.0		+-1.0	0.1
4 k	0.0	0.1	0.0		+-1.0	0.1
8 k	0.0	-0.1	0.0		+1.5,-3	-0.1
12.5 k	-0.1	0.7	0.0		+3,-6	0.6
Tout Danged						

Test Passed

The overall frequency response of the sound level meter, nominal case reflections and microphone has shown to conform with the requirements in §6 of the ANSI S1.4 for a type 1 sound level meter.

## **USTA NTP Master Plan Noise PCE Screening**

Noise Appendix

Intersection	No Action Volume (Fig. 10-5)	With Action Volume (Fig. 10-6)	dB change
AA Exit and GCP WB	2497	2669	0.3
AA Enter and GCP WB	3073	3255	0.2
GCP WB	5827	6114	0.2
VWE 8B offramp and CP Blvd	3984	4056	0.1
58th Rd and CP Blvd	3639	3773	0.2
Park entrance/exit	607	1037	2.3
Park exit and CP Blvd	3180	3557	0.5
59th Ave and CP Blvd	577	577	0.0
LIE WB Service Rd and CP Blvd	4031	4485	0.5
LIE EB Service RD and CP Blvd	4248	4517	0.3
GCP EB	5826	6113	0.2
GCP EB Onramp	1660	1935	0.7
GCP EB Offramp	2138	2200	0.1
HHE Offramp	3422	3521	0.1
HHE and GCP EB Offramp	3423	3523	0.1
HHE and GCP EB Onramp	2945	3258	0.4
HHE WB and LIE WB	2945	3258	0.4

Note: vehicle mix assumed unchanged