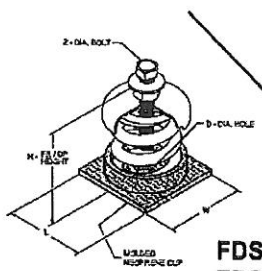
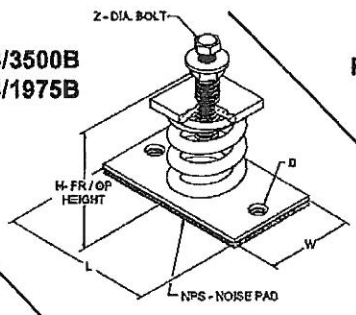
Isolator Type	Spring Color	Rated Capacity		Rated Deflection		Rated O.D.		Free Height		L		W		D		H		Z	
		lbs.	kg	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
FDS-2-100	Gray	100	45	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-135	Beige	135	61	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-185	Brown	185	84	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-225	Gray/Brn	225	102	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-250	Blue	250	113	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-375	Blue/Brn	375	170	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-500	Gren	500	227	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-625	Green/Brn	625	283	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-750	Black	750	340	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-875	Black/Brn	875	397	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-995	Orange	995	451	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-1120	Org/Brn	1120	508	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-1400	Org/Grn	1400	635	2.01	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-1600	Red	1600	726	2.00	51	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-1975	Red/Grn	1975	896	1.98	50	3.50	89	6.09	155	4.38	111	4.38	111	1.00	25	7.31	186	0.38	10
FDS-2-100B	Gray	100	45	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-135B	Gray	135	61	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-185B	Gray	185	84	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-225B	Gray/Gray	225	102	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-250B	Gray	250	113	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-375B	Gray/Gray	375	170	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-500B	Gray	500	227	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-625B	Gray/Gray	625	283	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-750B	Gray	750	340	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-875B	Gray/Gray	875	397	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-995B	Gray	995	451	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-1120B	Gray/Gray	1120	508	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-1400B	Gray/Gray	1400	635	2.01	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-1600B	Gray	1600	726	2.00	51	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-1975B	Gray/Gray	1975	896	1.98	50	3.50	89	6.09	155	7.00	178	4.00	102	0.69	17	7.50	191	0.38	10
FDS-2-2000B	Gray	2000	907	2.00	51	5.00	127	7.00	178	7.00	178	5.00	127	0.56	14	8.75	222	0.38	10
FDS-2-2500B	Gray	2500	1134	2.00	51	5.00	127	7.00	178	7.00	178	5.00	127	0.56	14	8.75	222	0.38	10
FDS-2-2750B	Gray/Gray	2750	1247	2.00	51	5.00	127	7.00	178	7.00	178	5.00	127	0.56	14	8.75	222	0.50	13
FDS-2-3025B	Gray/Gray	3025	1372	2.02	51	5.00	127	7.00	178	7.00	178	5.00	127	0.56	14	8.75	222	0.50	13
FDS-2-3250B	Gray/Gray	3250	1474	2.00	51	5.00	127	7.00	178	7.00	178	5.00	127	0.56	14	8.75	222	0.50	13
FDS-2-3500B	Gray/Gray	3500	1588	2.00	51	5.00	127	7.00	178	7.00	178	5.00	127	0.56	14	8.75	222	0.50	13
FDS-2-3900B	Gray/Gray	3900	1769	2.00	51	5.00	127	7.00	178	7.00	178	5.00	127	0.56	14	8.75	222	0.50	13
FDS-2-4100B	Gray/Gray	4100	1860	2.00	51	5.00	127	7.00	178	7.00	178	5.00	127	0.56	14	8.75	222	0.50	13
FDS-2-4500B	Gray/Gray	4500	2041	2.00	51	5.00	127	7.00	178	7.00	178	5.00	127	0.56	14	8.75	222	0.50	13
FDS-2-4000B	Gray	4000	1814	2.00	51	5.00	127	7.00	178	14.00	356	6.00	152	0.69	17	9.25	235	0.50	13
FDS-2-5000B	Gray	5000	2268	2.00	51	5.00	127	7.00	178	14.00	356	6.00	152	0.69	17	9.25	235	0.50	13
FDS-2-5500B	Gray/Gray	5500	2495	2.00	51	5.00	127	7.00	178	14.00	356	6.00	152	0.69	17	9.25	235	0.50	13
FDS-2-6050B	Gray/Gray	6050	2744	2.02	51	5.00	127	7.00	178	14.00	356	6.00	152	0.69	17	9.25	235	0.50	13
FDS-2-6500B	Gray/Gray	6500	2948	2.00	51	5.00	127	7.00	178	14.00	356	6.00	152	0.69	17	9.25	235	0.50	13
FDS-2-7000B	Gray/Gray	7000	3175	2.00	51	5.00	127	7.00	178	14.00	356	6.00	152	0.69	17	9.25	235	0.50	13
FDS-2-7800B	Gray/Gray	7800	3538	2.00	51	5.00	127	7.00	178	14.00	356	6.00	152	0.69	17	9.25	235	0.50	13
FDS-2-8200B	Gray/Gray	8200	3719	2.00	51	5.00	127	7.00	178	14.00	356	6.00	152	0.69	17	9.25	235	0.50	13
FDS-2-9000B	Gray/Gray	9000	4082	2.00	51	5.00	127	7.00	178	14.00	356	6.00	152	0.69	17	9.25	235	0.50	13
FDS-2-8000B	Gray	8000	3629	2.00	51	5.00	127	7.00	178	12.00	305	11.00	279	0.81	21	11.75	298	1.25	32
FDS-2-10000B	Gray	10000	4536	2.00	51	5.00	127	7.00	178	12.00	305	11.00	279	0.81	21	11.75	298	1.25	32
FDS-2-11000B	Gray/Gray	11000	4990	2.00	51	5.00	127	7.00	178	12.00	305	11.00	279	0.81	21	11.75	298	1.50	38
FDS-2-12100B	Gray/Gray	12100	5488	2.02	51	5.00	127	7.00	178	12.00	305	11.00	279	0.81	21	11.75	298	1.50	38
FDS-2-13000B	Gray/Gray	13000	5897	2.00	51	5.00	127	7.00	178	12.00	305	11.00	279	0.81	21	11.75	298	1.50	38
FDS-2-14000B	Gray/Gray	14000	6350	2.00	51	5.00	127	7.00	178	12.00	305	11.00	279	0.81	21	11.75	298	1.50	38
FDS-2-15600B	Gray/Gray	15600	7076	2.00	51	5.00	127	7.00	178	12.00	305	11.00	279	0.81	21	11.75	298	1.50	38
FDS-2-16400B	Gray/Gray	16400	7439	2.00	51	5.00	127	7.00	178	12.00	305	11.00	279	0.81	21	11.75	298	1.50	38
FDS-2-18000B	Gray/Gray	18000	8165	2.00	51	5.00	127	7.00	178	12.00	305	11.00	279	0.81	21	11.75	298	1.50	38



FDS-1-35/3500
FDS-2-100/1975

FDS-1-120B/3500B
FDS-2-100B/1975B



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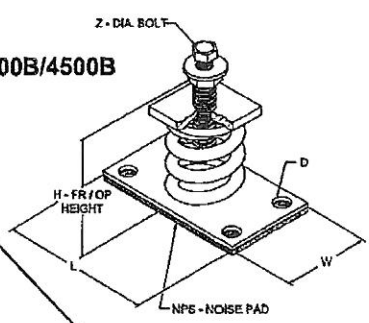

Specifications

Vibration isolators shall be free standing, unhoused, laterally stabile steel springs. Springs shall have a lateral stiffness greater than 1.0 times the rated vertical stiffness and shall be designed to provide a minimum 50% overload capacity.

Springs shall be assembled or welded between top and bottom load plates. The upper load plate shall be provided with steel leveling bolts, lock nut and washer for attachment to the supported equipment. The lower load plate shall incorporate a non-skid noise isolation pad and shall have provisions for bolting the isolator to the supporting structure, as required.

Springs shall be selected to provide operating static deflections shown on the Vibration Isolation Schedule or as otherwise indicated on the project documents. Springs shall be color coded or otherwise identified to indicate load capacity.

Spring isolation mounts for floor-mounted equipment shall be Model FDS, as manufactured by Kinetics Noise Control, Inc.

KINETICS Noise Control

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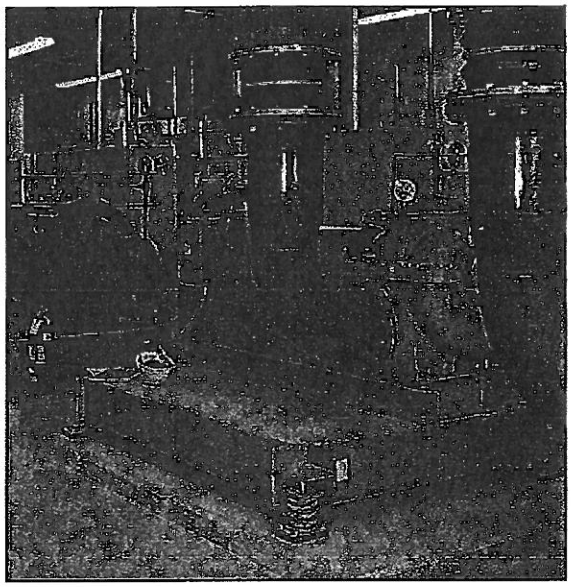
KINETICS™
Free Standing Spring Isolators
Model FDS-4

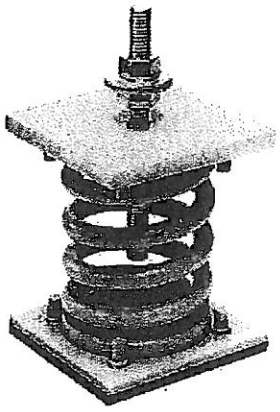
Description

Kinetics Model FDS Spring Vibration Isolators consist of high deflection, free-standing, unhoused, large diameter, laterally stable steel springs assembled into an upper load plate and leveling assembly. To assure stability, the spring isolators have lateral spring stiffness greater than 1.0 times the rated vertical stiffness and are designed to provide a minimum 50% overload capacity. Springs are epoxy powder coated, with a 1,000-hour salt spray rating per ASTM B-117. In lighter capacities, FDS Spring Isolators have molded neoprene bottom load plate assemblies. In heavier capacities, springs are welded to the load plate assemblies and are furnished with a neoprene noise isolation pad. FDS Isolators have provisions for bolting the isolator to the structure. FDS Isolators are available with deflections to 4" (102 mm) and with load capacities to 23,200 lbs. (10,523 kg) as standard products. Custom isolators with higher deflection and greater load capacities are also available. Kinetics Model FDS Spring Isolators are highly effective for control of both high and low frequency vibration produced by reciprocating air or refrigeration compressors, pumps, packaged air-handling and air-conditioning equipment, centrifugal and axial fans, internal combustion engines, etc.



Application

Kinetics Model FDS spring mounts are recommended for use in isolating floor mounted sources of noise and vibration located near critically quiet areas.



Model FDS spring mounts are typically used to reduce the transmission of noise and vibration from low speed mechanical equipment into a building structure. Operating static deflections are available up to 4" (102 mm) to compensate for long span flexible floor structures.

Model FDS spring mounts are used in a wide range of applications, some requiring Kinetics equipment bases in addition to spring isolators, and can be used to support and isolate the following equipment types: reciprocating air or refrigeration compressors, close coupled and base-mounted pumps, packaged air-handling and refrigeration equipment, centrifugal fans, internal combustion engines, and similar equipment. Model FDS Isolators are for use on equipment that is not subject to lateral forces such as wind.

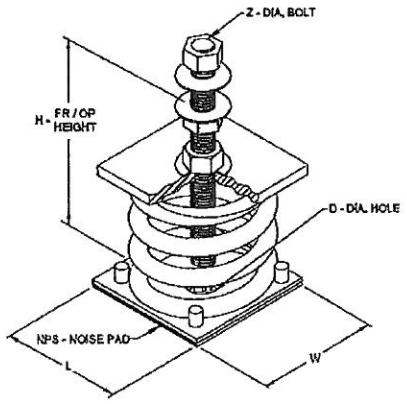
Specifications

Vibration isolators shall be free standing, unhoused, laterally stabile steel springs. Springs shall have a lateral stiffness greater than 1.0 times the rated vertical stiffness and shall be designed to provide a minimum 50% overload capacity.

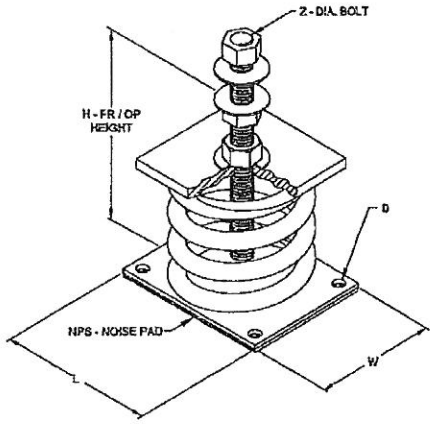
Springs shall be assembled or welded between top and bottom load plates. The upper load plate shall be provided with steel leveling bolts, lock nut and washer for attachment to the supported equipment. The lower load plate shall incorporate a non-skid noise isolation pad and shall have provisions for bolting the isolator to the supporting structure, as required.

Springs shall be selected to provide operating static deflections shown on the Vibration Isolation Schedule or as otherwise indicated on the project documents. Springs shall be color coded or otherwise identified to indicate load capacity.

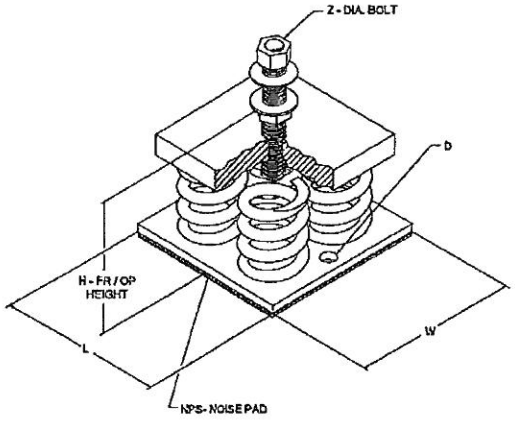
Spring isolation mounts for floor-mounted equipment shall be Model FDS, as manufactured by Kinetics Noise Control, Inc.



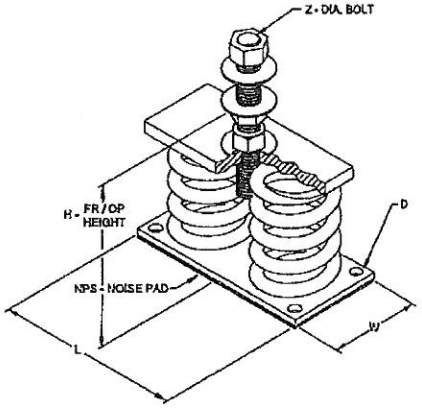
FDS-4-100/1600



FDS-4-2250B/5800B



FDS-4-11000B/23200B



FDS-4-5500B/11600B

Isolator Type	Spring Color	Rated Load		Rated Deflection		Spring O.D.		Free Height		L		W		D		H		Z	
		lbs.	kg	In.	mm	In.	mm	in.	mm	In.	mm	In.	mm	in.	mm	In.	mm	In.	mm
FDS-4-100	Gray	100	46	4.00	102	5.63	143	10.00	254	6.00	152	6.00	152	0.81	21	13.00	330	0.88	22
FDS-4-250	Blue	250	114	4.00	102	5.63	143	10.00	254	6.00	152	6.00	152	0.81	21	13.00	330	0.88	22
FDS-4-500	Green	500	227	4.00	102	5.63	143	10.00	254	6.00	152	6.00	152	0.81	21	13.00	330	0.88	22
FDS-4-750	Black	750	341	4.00	102	5.63	143	10.00	254	6.00	152	6.00	152	0.81	21	13.00	330	0.88	22
FDS-4-1000	Red	1000	455	4.00	102	5.63	143	10.00	254	6.00	152	6.00	152	0.81	21	13.00	330	0.88	22
FDS-4-1250	Brown	1250	568	4.00	102	5.63	143	10.00	254	6.00	152	6.00	152	0.81	21	13.00	330	0.88	22
FDS-4-1600	Org	1600	727	4.00	102	5.63	143	10.00	254	6.00	152	6.00	152	0.81	21	13.00	330	0.88	22
FDS-4-2250B	Gray	2250	1023	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-2500B	Gray	2500	1136	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-2750B	Gray	2750	1250	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-3000B	Gray	3000	1364	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-3250B	Gray	3250	1477	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-3500B	Gray	3500	1591	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-3850B	Gray	3850	1746	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-4200B	Gray	4200	1905	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-4450B	Gray	4450	2019	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-4700B	Gray	4700	2132	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-4950B	Gray	4950	2245	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-5200B	Gray	5200	2359	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-5450B	Gray	5450	2472	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-5800B	Gray	5800	2631	4.00	102	8.00	203	11.50	292	10.00	254	8.00	203	0.69	18	15.25	387	1.25	32
FDS-4-5500B	Gray	5500	2495	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-6000B	Gray	6000	2722	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-6500B	Gray	6500	2948	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-7000B	Gray	7000	3175	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-7700B	Gray	7700	3493	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-8400B	Gray	8400	3810	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-8900B	Gray	8900	4037	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-9400B	Gray	9400	4264	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-9900B	Gray	9900	4491	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-10400B	Gray	10400	4717	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-10900B	Gray	10900	4944	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-11600B	Gray	11600	5262	4.00	102	8.00	203	11.50	292	18.50	470	8.00	203	0.69	18	16.00	406	1.25	32
FDS-4-11000B	Gray	11000	4990	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	16.75	425	1.50	38
FDS-4-12000B	Gray	12000	5443	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	16.75	425	1.50	38
FDS-4-13000B	Gray	13000	5897	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	16.75	425	1.50	38
FDS-4-14000B	Gray	14000	6350	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	16.75	425	1.50	38
FDS-4-15400B	Gray	15400	6985	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	16.75	425	1.50	38
FDS-4-16800B	Gray	16800	7620	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	16.75	425	1.50	38
FDS-4-17800B	Gray	17800	8074	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	16.75	425	1.50	38
FDS-4-18800B	Gray	18800	8528	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	17.25	438	1.75	44
FDS-4-19800B	Gray	19800	8982	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	17.25	438	1.75	44
FDS-4-20800B	Gray	20800	9435	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	17.25	438	1.75	44
FDS-4-21800B	Gray	21800	9888	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	17.25	438	1.75	44
FDS-4-23200B	Gray	23200	10524	4.00	102	8.00	203	11.50	292	18.00	457	16.00	406	0.81	21	17.25	438	1.75	44

KINETICS
Noise Control

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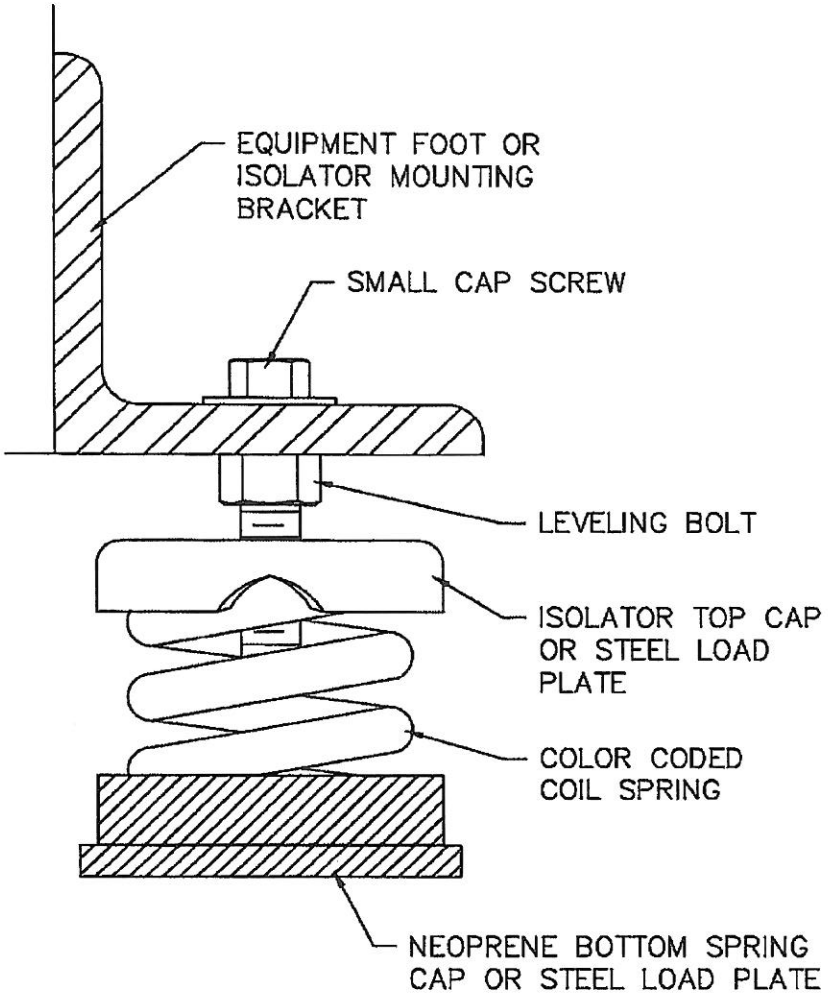
sales@kineticsnoise.com

INSTALLATION INSTRUCTIONS
FOR
TYPE FDS KINETICS SPRING ISOLATION MOUNTS



1. THREAD THE LEVELING BOLT INTO THE TOP LOAD PLATE OF THE SPRING, UNTIL THE HEAD OF THE BOLT IS WITHIN 1/8" OF THE TOP LOAD PLATE OF THE SPRING.
2. COORDINATE THE LOCATION OF EACH ISOLATOR WITH THE APPROPRIATE SUBMITTAL DRAWING AND WITH THE COLOR CODE CHART PROVIDED FOR EACH SPRING.
3. REMOVE THE SMALL CAP SCREW AND WASHER. RAISE THE EQUIPMENT BASE WITH JACKS OR SIMILAR TOOLS (DO NOT ATTEMPT TO RAISE THE EQUIPMENT VIA ONE (1) LIFTING POINT, BUT LIFT EVENLY AROUND THE PERIMETER OF THE EQUIPMENT). SLIDE THE SPRING ISOLATOR UNDER THE EQUIPMENT OR MOUNTING BRACKET WITH THE BOLT HEAD ON THE UNDERSIDE OF THE BRACKET.
4. INSERT THE SMALL CAP SCREW THROUGH THE BRACKET AND THREAD INTO THE TOP OF THE LEVELING BOLT AND TIGHTEN FINGER TIGHT.
5. IF THE EQUIPMENT WEIGHS 1,000 LBS. OR MORE, THE PLACEMENT OF BLOCKS BENEATH THE EQUIPMENT NEAR EACH ISOLATOR POINT WILL ASSIST INSTALLATION. THE HEIGHT OF EACH BLOCK SHOULD BE SUCH THAT THE EQUIPMENT WILL BE AT ITS REQUIRED OPERATING HEIGHT WHEN SITTING ON THE BLOCKS.
6. LOWER THE EQUIPMENT (EVENLY) ONTO THE SPRING ISOLATORS OR BLOCKS, TAKING CARE NOT TO OVERLOAD ANY ONE ISOLATOR AND TAKING CARE NOT TO PUSH THE EQUIPMENT SIDEWAYS.
7. FOR SMALL EQUIPMENT, WHERE BLOCKS ARE NOT USED, TURN THE LEVELING BOLT COUNTER CLOCKWISE ON THE LOWEST EQUIPMENT CORNER UNTIL THE EQUIPMENT IS LEVEL. DO NOT ATTEMPT TO PLACE ALL THE WEIGHT ON ONE SPRING, BUT DISTRIBUTE THE LOAD PROPORTIONATELY BY ADJUSTING EACH ISOLATOR IN SEQUENCE.
8. FOR LARGER EQUIPMENT, WHERE BLOCKS ARE USED, TURN THE LEVELING BOLT COUNTER CLOCKWISE UNTIL THE EQUIPMENT JUST COMES FREE FROM THE BLOCKS. THE BLOCKS MAY THEN BE REMOVED. IT MAY BE DESIRED TO LEAVE THE EQUIPMENT ON BLOCKS UNTIL IT IS OPERATING, THUS ELIMINATING FUTURE RELEVELING SHOULD THERE BE A MAJOR WEIGHT SHIFT DURING EQUIPMENT START UP.
9. CONTINUE TO ADJUST EACH LEVELING BOLT (IN SEQUENCE) UNTIL THE EQUIPMENT IS AT ITS OPERATING HEIGHT, SHOWN IN THE APPROPRIATE SUBMITTAL DRAWING.
10. TIGHTEN THE SMALL CAP SCREW, THUS SECURING THE SPRING ISOLATOR TO THE SUPPORTED EQUIPMENT AND LOCKING THE LEVELING BOLT AGAINST TURNING.
11. DO NOT ATTEMPT TO MOVE THE EQUIPMENT LATERALLY WHILE IT IS SUPPORTED ON THE ISOLATORS. IF IT IS NECESSARY TO MOVE THE EQUIPMENT, REMOVE THE WEIGHT FROM THE ISOLATORS BY RAISING THE EQUIPMENT BEFORE MOVING. FAILURE TO FOLLOW THIS PROCEDURE COULD RESULT IN BENT OR BROKEN LEVELING BOLTS OR SPRINGS, OR DAMAGE TO THE NEOPRENE BOTTOM SPRING CAP.

KINETICS Noise Control	TITLE	LAST DATE REVISED	REVISED BY	DRAWING NO.
	FDS INSTALATION INSTRUCTIONS	03/20/91	KC	SS-900805

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NOISE LEVEL ANALYSIS TERMS

Sound Pressure Level (SPL) = The RMS sound pressure expressed in dB re 20 microPa, the lowest threshold of hearing for 1 kHz for a healthy auditory system. [As points of reference, 0 dB-SPL equals the threshold of hearing, while 140 dB-SPL equals irreparable hearing damage.] See: **Inverse square law** below. 1 Pascal = 94 dB SPL. Average face-to-face conversation equals approximately 65 dB SPL.

Decibel (dB) = means of expressing power ratios, i.e. the difference between two sound levels, or an absolute sound level expressed in Sound Pressure Level (SPL) referenced to a standard pressure, i.e. 94 dB SPL = 1 Pascal.

dBA = "A" weighted sound pressure level. Please refer to the attached discussion of weighting filters and their applications.

SLM = Sound Level Meter. Device used to measure sound pressure levels.

L_{min} = Lowest, or softest, Sound Pressure Level measured during the test period.

L_{max} = Highest, or loudest, Sound Pressure Level measured during the test period.

L_{eq} = Equivalent continuous sound level. The steady level which would produce the same sound energy over the test period as the specified time-varying sound. This figure is useful for studying long-term trends in environmental noise. A single L_{eq} number is often used to define an entire measurement period.

L_{10} = Sound level exceeded 10% of the measurement period. Highest of the Ln figures.

L_{50} = Sound level exceeded 50% of the measurement period. Median of the Ln figures.

L_{90} = Sound level exceeded 90% of the measurement period. Lowest of the Ln figures. This figure is most commonly used in estimating true ambient noise level.

L_{mean} = Mathematically averaged Sound Pressure Level.

NC = Noise Criteria, a standardized method of characterizing noise loudness. Extensively used in the analysis of noise and vibration.

Sone = a subjective unit of loudness for an average listener equal to the loudness of a 1 kHz. sound that has an intensity 40 decibels above the listener's own threshold of hearing.

Phon = the unit of loudness on a scale beginning at zero for the faintest audible sound (0.00002 Pascals) and corresponding to the decibel scale of sound intensity with the number of phons of a given sound being equal to the decibels of a pure 1 kHz tone judged by the average listener to be equal in loudness to the given sound.

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Inverse Square Law = Inverse square law Sound Pressure Level. Sound propagates in all directions to form a spherical field, thus sound energy is inversely proportional to the square of the distance, i.e., doubling the distance quarters the sound energy (the inverse square law), so SPL is attenuated 6 dB for each doubling of distance from the source.

Noise Reduction Coefficient (NRC) = The average of the individual sound absorption coefficients at 250, 500, 1000 and 2000 Hz, to the nearest .05.

Impact Insulation Class (IIC) = Single-number rating that indicates the amount of impact noise isolation provided by a floor/ceiling assembly. The higher the number, the better the floor/ceiling assembly.

Sound Transmission Class (STC) = A single-number rating that indicates the sound transmission loss of a partition or ceiling system between adjacent closed rooms. STC Ratings are:

25 Normal speech can be understood quite clearly
30 Loud speech can be understood fairly well
35 Loud speech is audible but not intelligible
42 Loud speech is audible as a murmur
45 Must strain to hear loud speech
48 Some loud speech is barely audible
50 Loud speech is not audible

Definitions

1) **sonic**: utilizing, produced by, or relating to sound waves; broadly: of or involving sound: having a frequency within the audibility range of the human ear: of, relating to, or being the speed of sound in air or about 761 miles per hour (1224 kilometers per hour) at sea level at 59°F (15°C)
2) **subsonic**: of, relating to, or being a speed less than that of sound in air
3) **supersonic**: of, being, or relating to speeds from one to five times the speed of sound in air
4) **hypersonic**: of or relating to speed five or more times that of sound in air
5) **audio**: of or relating to acoustic, mechanical, or electrical frequencies corresponding to normally audible sound waves which are of frequencies approximately from 20 to 20,000 hertz
6) **infrasonic**: having or relating to a frequency below the audibility range of the human ear (< 20 Hz)
7) **ultrasonic**: having a frequency above the human ear's audibility limit of about 20,000 hertz
8) **audible**: heard or capable of being heard
9) **intelligible**: capable of being understood or comprehended
10) **aural**: heard or perceived with the ear

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11) **auditory**: of, relating to, or experienced through the sense of hearing

12) **acoustic**: of or relating to the sense or organs of hearing, to sound, or to the science of sounds

13) **vibration**: a periodic motion of the particles of an elastic body or medium in alternately opposite directions from the position of equilibrium when that equilibrium has been disturbed (as when a stretched cord produces musical tones or particles of air transmit sounds to the ear)

14) **noise**:
- **1** loud, confused, or senseless shouting or outcry
- **2** **a:** SOUND; *esp.* **:** one that lacks agreeable musical quality or is noticeably unpleasant
  - **b:** any sound that is undesired or interferes with one's hearing of something
  - **c:** an unwanted signal or a disturbance (as static or a variation of voltage) in an electronic device or instrument (as radio or television); *broadly* **:** a disturbance interfering with the operation of a usu. mechanical device or system
  - **d:** electromagnetic radiation (as light or radio waves) that is composed of several frequencies and that involves random changes in frequency or amplitude
  - **e:** irrelevant or meaningless data or output occurring along with desired information

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Sound Level Meter Weighting Networks

The following brief description of how the various weighting networks are used is intended to provide the reader an understanding of the purposes for and applications of standard weighting networks found in professional sound level meters. The information is an extract from "The New Audio Cyclopedia, Handbook for Sound Engineers", edited by Glen Ballou. It can be found on page 21 of that reference publication.

1.16 Weighting Networks

Sound level meters come with one or more weighting networks built in. The question confronting the user is, "Which one should I use?" The frequency responses of the three standard networks (A, B and C) are shown in figure 1-16. In the simplest terms, these different curves are designed to give readings of sound pressure level that will correspond, at least roughly, with human response to the sound. As we shall see in Chapter 2 "Psycho Acoustics," the Fletcher-Munson curves show that the human ear is less sensitive at lower frequencies than at a frequency of 1 kHz. This effect is greater for lower-level sounds than for louder sounds. Therefore, it makes sense to reduce the sensitivity of the sound level meter (chiefly in the lower frequencies) so that its readings follow the characteristics of the ear more closely.

The A-weighted curve of Fig. 1-16 is based on the 40 phon Fletcher-Munson equal-loudness contour and is to be preferred for measuring lower-level sounds such as background noise. The B-weighted curve is based on the 70-phon equal-loudness contour and is suitable for measuring sounds of intermediate level. Measurements taken with the A and B weighting are called *weighted sound levels.* The C weighting is essentially flat and is used for very loud sounds. It is also used when *sound pressure levels* are to be measured and generally when the sound level meter feeds a signal to other instruments for analysis.

Table 1-4. Use of Weighting Networks

Sound Level Range, in dB	Recommended Weighting Network
20 - 55	A
55 - 85	B
85 - 140	C

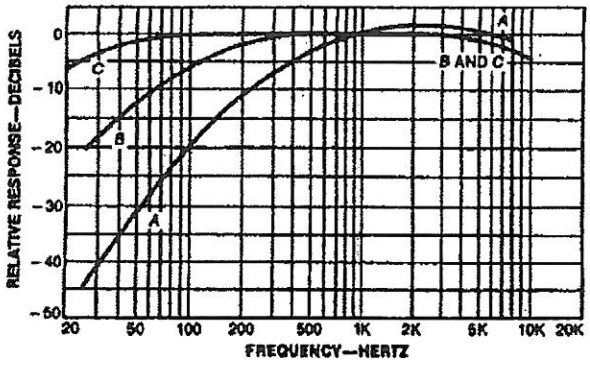
Table 1-4 gives general suggestions as to which weighting to use for different sound level ranges.

When comparing different sound levels, such as in Table 1-5, it may be expedient to use the A-weighting for the entire range rather than to shift weighting in the midst of a series of measurements to be directly compared.

Table 1-5. Typical A-Weighted Sound Levels

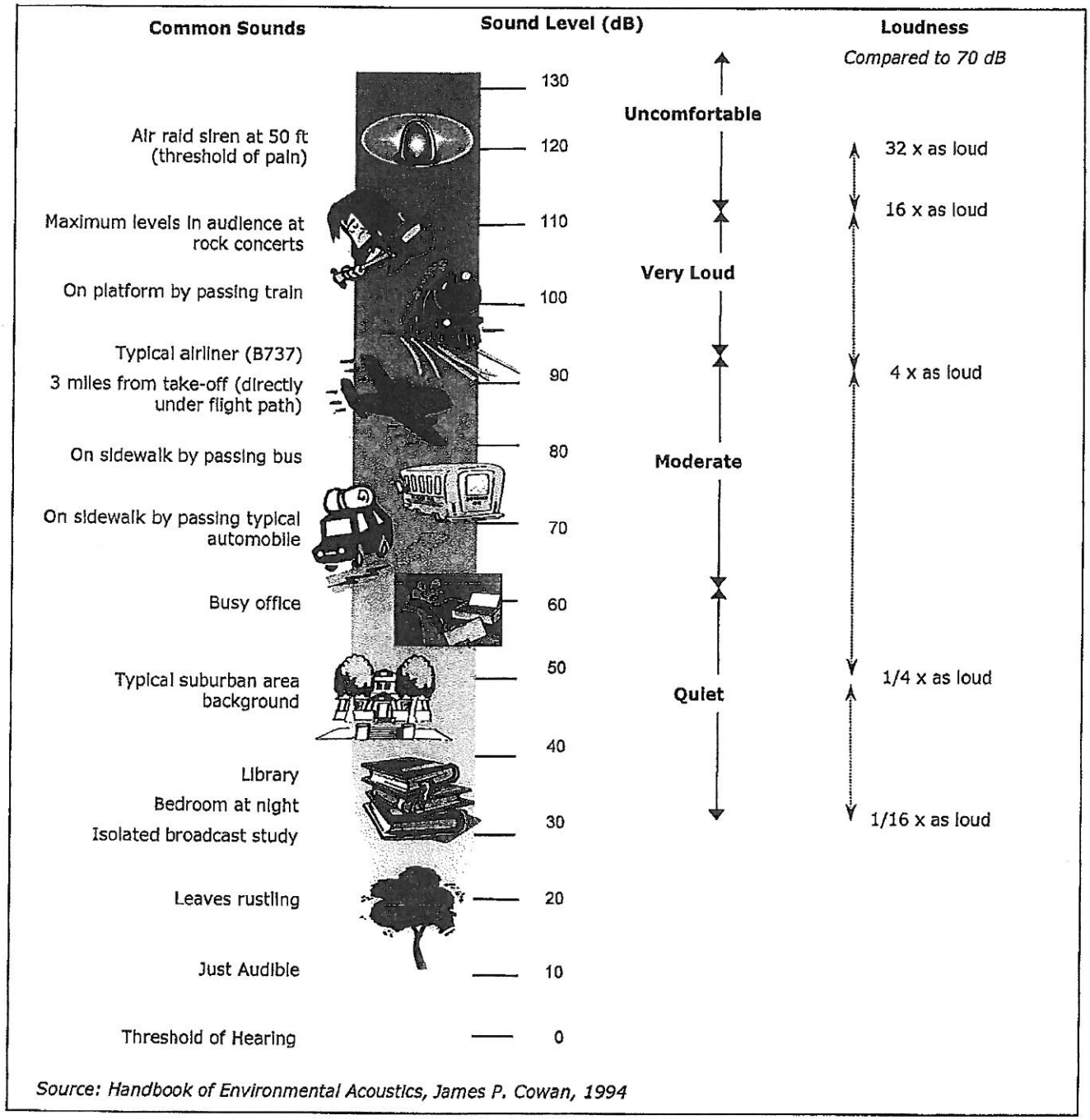
Sound Source	Sound Pressure Level, Decibels, (A-Weighted)
Jet airplane taking off (200 ft.)	120
Subway train (20 ft.)	90
Freight Train (100 ft.)	70
Speech (1 ft.)	70
Shopping Mall	60
Average residence with TV	50
Quiet residential area at night	40
Soft whisper	30
Recording studio background noise	30
Threshold of hearing	20

Figure 1.16 - Weighting Networks



Frequency Response Characteristics in the American National Standard Specification for Sound Level Meters, ANSI-31.4-1971.

Typical Sound Levels



Source: Handbook of Environmental Acoustics, James P. Cowan, 1994

EDWARD DUGGER + ASSOCIATES, P.A.
Consultants in Architectural Acoustics
Mechanical/Vibration Noise Control and
Audio/Video/IT Systems

TRANSMITTAL

Date: 29 June 2012

To: Katia M. Hirsh
Miami Beach Planning Department
1700 Convention Center Drive
Miami Beach, FL 33139

From: Edward Dugger, AIA ASA NCAC

Re: **Sound Study Peer Review**
PB 2074, 2000 Collins Avenue (Units 6, 7, 8, and 10) Barezzito
Miami Beach, Florida
ED+A 10368.13

Number of pages included with this sheet: 3

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY X FOR YOUR USE

Please find attached the following items:

1. Peer Review of The Audio Bug, Inc. Noise Study Report, issued 4 June 2012.

5. The anticipated sound level in the indoor entertainment area is not called out, but assuming levels near 100 dB, preventing the transmission of sound through the ceiling to the condo units above will be critical. The Sound Transmission Class (STC) rating of the ceiling assembly should be at least STC 50 for appropriate sound levels to be maintained in the units above. We would like to reiterate that FSTC (Field Sound Transmission Class) testing should be done and measures be taken to ensure this STC rating is met.

6. Since the exterior envelope of the building is not yet built-out, now it is the best time to require that a certain STC rating be met for the exterior wall assembly. We suggest the exterior wall be rated at minimum STC 50 and once installed its final performance should be confirmed with field façade testing.

With these alterations it is our belief that the sound study report for PB 2074 for the application of a Conditional Use Permit for a Neighborhood Impact Establishment at 2000 Collins Avenue (Units 6, 7, 8, and 10) Barezzito Restaurant, Miami Beach, Florida conducted by The Audio Bug, Inc., dated 4 June 2012, is appropriate. If you have any questions please contact us and we will be happy to assist you in the future.

Regards,

Edward Dugger

Edward Dugger, AIA ASA NCAC

THE AUDIO BUG, INC.

3800 HILLCREST DRIVE, # 102 • HOLLYWOOD, FL 33021-7937 • PHONE: 954-983-2788 • FAX: 954-983-2789 • audiobug1@aol.com

July 6, 2012

Richard G. Lorber, Director
City of Miami Beach Planning Department
1700 Convention Center Drive, 2nd Floor
Miami Beach, FL 33139
Phone: (305) 673-7550, Fax: (786) 394-4799

Reference: Sound Study Peer Review
PB 2074, Barezzito Restaurant
2000 Collins Avenue (Units 6, 7, 8, and 10)
Miami Beach, Florida
ED+A 10368.13

Dear Mr. Lorber,

I would like to take this opportunity to respond to recommendations submitted by Edward Dugger + Associates in their peer review letter dated June 29, 2012. As always, Mr. Dugger has provide a thoughtful review of our Sound Study. I'll address his recommendations in the order presented in his letter.

1. All requirements to meet ASTM measurement methods and standards with respect to measurement equipment, calibration and technique has been put on record with the City of Miami Beach Planning Department and is available for review.

   ♦ This information is routinely provided to the client as part of our quotation process. I will gladly provide copies for the City's records upon request.

2. The report indicates that the sound level of the outdoor sound system will be limited to 60 dBA but does not indicate how this level is maintained, whether manually by operating personnel or by limits built into the equipment as described for the indoor portion of the sound system (preferred).

   ♦ The Sound System will be equipped with digital signal processors capable of providing control over program dynamics. These parameters will be set as part of the system optimization process in cooperation with the system integrator.

3. We would also suggest that the entrance vestibules, in addition to being treating with absorptive material, have a full set of perimeter door seals installed on each set of doors to further contain noise within the establishment.

   ♦ Doors at all entrances will be sound rated to ensure complete containment of music consistent with sound transmission characteristics of the exterior envelope.

4. The sound level monitoring software and display equipment is appropriate, but we suggest that a higher quality measurement microphone be used (see Brüel & Kjær, or Earthworks microphones).

   ♦ The microphones shown in the monitoring equipment literature provide with the original sound study were solely for the purpose of indicating that measurement microphones are a necessary component of the system. The system integrator will be instructed to provide quality microphones suitable for accurately monitoring system levels within four zones in the facility. Likely sources of

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microphones might include those mentioned above along with other manufacturers of quality measurement-grade devices. Microphones will undergo periodic calibration (minimum annually) to verify accurate performance is maintained.

5. The anticipated sound level in the indoor entertainment area is not called out, but assuming levels near 100 dB, preventing the transmission of sound through the ceiling to the condo units above will be critical. The Sound Transmission Class (STC) rating of the ceiling assembly should be at least STC 50 for appropriate sound levels to be maintained in the units above. We would like to reiterate that FSTC (Field Sound Transmission Class) testing should be done and measures be taken to ensure this STC rating is met.

   ♦ Preliminary sound transmission tests have already been conducted and Jim Maloney, the local representative for Kinetics Noise Control is scheduled to meet with me on Tuesday, July 10th at the project site to inspect the structure. Kinetics' engineers will be involved in the design of a floating ceiling assembly capable of provide a minimum STC65 to ensure immunity from noise in the condos located above the restaurant. Tests will be performed to verify the performance of this assembly and the results will be provided to the City of Miami Beach Planning Staff for their records.

6. Since the exterior envelope of the building is not yet built-out, now it is the best time to require that a certain STC rating be met for the exterior wall assembly. We suggest the exterior wall be rated at minimum STC 50 and once installed its final performance should be confirmed with field façade testing.

   ♦ The same steps outlined above for the ceiling will be applied to the exterior envelope to minimize sound transmission to the neighborhood. As with the ceiling, preliminary sound transmission tests have already been performed on the as yet unfinished shell to assess leaks and plan for appropriate measures to ensure the necessary containment of music. As with the ceiling, tests will be performed to verify the performance of the walls and the results will be provided to the City of Miami Beach Planning Staff for their records.

I invite any questions you or your staff may have concerning our response to Mr. Dugger's peer review. Please feel free to contact me at your convenience.

Respectfully submitted,

Donald J. Washburn

Donald J. Washburn
President

Jim Rauh

From: Edward Dugger <edward@edplusa.com>
Sent: Monday, July 09, 2012 12:07 PM
To: Hirsh, Katia
Cc: Jim Rauh; Emily Garber
Subject: RE: PB 2074 - 2000 Collins Ave (Units 6, 7, 8, and 10) Barezzito - PEER REVIEW

Katia,

Don's responses seem appropriate. I'm satisfied.

Edward Dugger, AIA ASA NCAC

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Stuart, FL 34994

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772.631.4590 c

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From: Hirsh, Katia [mailto:KatiaHirsh@miamibeachfl.gov]
Sent: Monday, July 09, 2012 11:43 AM
To: Edward Dugger
Cc: Jim Rauh; Emily Garber
Subject: RE: PB 2074 - 2000 Collins Ave (Units 6, 7, 8, and 10) Barezzito - PEER REVIEW
Importance: High

Ed, please see Don's response to your recommendations attached. Are you satisfied? Please let me know asap....trying to finish my report this afternoon.
Thanks.

Katia M. Hirsh
Senior Planner
MIAMIBEACH
PLANNING DEPARTMENT
1700 Convention Center Drive, Miami Beach, FL 33139
Tel: 305-673-7000 x6302 / Fax: 305-673-7559 / www.miamibeachfl.gov

We are committed to providing excellent public service and safety to all who live, work and play in our vibrant, tropical, historic community.

From: Edward Dugger [mailto:edward@edplusa.com]
Sent: Friday, June 29, 2012 1:35 PM
To: Hirsh, Katia
Cc: Jim Rauh; Emily Garber
Subject: RE: PB 2074 - 2000 Collins Ave (Units 6, 7, 8, and 10) Barezzito - PEER REVIEW

Katia,

Peer Review report attached. I'll FEDEX the copies and CD out on Tuesday unless I hear otherwise.

Edward Dugger, AIA ASA NCAC

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Consultants in Architectural Acoustics
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772.872.5920 f
772.631.4590 c

www.edplusa.com

From: Hirsh, Katia [mailto:KatiaHirsh@miamibeachfl.gov]
Sent: Wednesday, June 13, 2012 10:30 AM
To: Hirsh, Katia
Cc: Jim Rauh
Subject: FW: PB 2074 - 2000 Collins Ave (Units 6, 7, 8, and 10) Barezzito - PEER REVIEW
Importance: High

To All Sound Consultants (bcc'd),

We received an application for Conditional Use approval for the above referenced project going before the Planning Board at the July 24, 2012 meeting. Please see description of the project attached.

We need a peer review of the sound study conducted by The Audio Bug, Inc., attached. As usual, please include in your proposal a dollar amount for each itemized task, the hourly fees for each staff person working on the project, any travel expenses, and the grand total cost for the report.

The deadline for the peer review report to be completed and submitted to us (1 original and 12 copies plus a CD) is Thursday, June 28. Kindly respond to me via email by Monday, June 18 . Also please be advised that if selected, you should be present at the July 24 meeting to answer any questions board members may have.

Should you need any additional information, please let me know. I look forward to hearing from you shortly. If you are unavailable or not interested, please disregard.

Thank you.

Katia M. Hirsh
Senior Planner
MIAMIBEACH
PLANNING DEPARTMENT
1700 Convention Center Drive, Miami Beach, FL 33139
Tel: 305-673-7000 x6302 / Fax: 305-673-7559 / www.miamibeachfl.gov

We are committed to providing excellent public service and safety to all who live, work and play in our vibrant, tropical, historic community.

From: Jim Rauh [mailto:jrauh@terminello.com]
Sent: Tuesday, June 12, 2012 2:45 PM
To: Hirsh, Katia
Subject: 2000 Collins Ave (Units 6, 7, 8, and 10) Barezzito - planning board application

Katia:

Attached is a copy of the sound study and application materials for the City sound consultant's peer review. The application for a conditioan use permit will be set for hearing on the July 24th agenda. Please let me know whether you require any additional materials or information for your consultant's peer review and please let me know the fee so we can deliver a check from the applicant for cost of the peer review. Also, kindly forward me an electronic copy of the peer review when completed.

Sincerely,

James E. Rauh, Esquire | Terminello & Terminello, P.A.
1111 Lincoln Road, Suite 400, Miami Beach, Florida 33139
t 786.276.2343 | c 305.510.4077 | f 305.448.5566
jrauh@terminello.com