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Specifications for Modular Sound Shadow® Sound Masking Sound Management Group, LLC.

1.01 General Requirements

This section details general requirements for plenum sound masking installations.

1.1 Contract

All work shall conform to contract documents

1.2 Additional Work

Additional work required prior to completion of the sound masking system shall be indicated on the drawings for the system but not necessarily limited to the following:

1.2.1 Hangers

Hangers or power driven fasteners located on recommended speaker mounting centers in accordance with contract drawings.

1.2.2 Power

Installation of separate 115 volt, 15 ampere circuit (non-switched) at nearest utility panel within 40 feet (12m) of M-101 Master Control Unit location. This circuit supplies the 40 VA transformer which powers each Master Control Unit. The Circuit breaker for each sound masking transformer must be clearly marked.

1.2.3 Cabling

The installation of cables in a plenum will normally require the use of jacketed 18Ga. NEC 725b, class 2 Teflon or equivalent cables. The speakers will use two pin polarized IDC connectors at both of the cable's ends. The power cable will have only one five pin polarized IDC connector for the Master Control unit end and a spade
connector configuration for the transformer end.

1.2.4 Transformer Installation

Installation of Class 2 40 VA Transformer at utility panel/ junction box with 1.2.2 and all applicable electrical codes. A plug-in transformer may also be used where it is in a secure place.

1.2.5 Related Work

Testing of power circuits, properly hanging and connecting the speakers, and adjusting the system for levels within the environment.

1.3 Submittals

1.3.1 Drawings

Drawings submitted to the owner prior to delivery of materials shall consist of complete shop drawings for the following:

a. Floor circuit diagrams
b. Power transformer and speaker locations
c. Connector and Cable Runs

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1.3.2 Data Sheets
Product Data for each installed item
1.3.4 Operation and Maintenance Guidelines
An operation and maintenance guideline reference sheet will be provided to the owner after the installation and tuning of the system(s).

1.4 Quality Assurance

1.4.1 Electrical Contractors
The electrical contractor shall be licensed to install power panels and circuits for powering transformers to all codes where hard wired transformers are used.
1.4.2 Masking System Installers
The masking system installers shall be trained and qualified to install and troubleshoot electrical hook-up and/or acoustical problems with authority to replace any damaged or defective masking system components without additional costs to customer.
1.4.3 Protection By Installers
All means will be employed to protect the system components from damage and likewise protection will be extended to protect the installed work of other trades.
1.4.4 Manufacturers
The manufacturer will be regularly engaged in the manufacturing of sound masking systems and will be responsible for manufacturing said product using transformers, wiring and other components in accordance with NEC725, Class 2 codes or their equal. WARRANTY of said system components will be for one year at full material value and then prorated for the next four years at 25% per year.
1.4.5 Performance
The sound masking system will deliver a uniform sound level of ±dB in the areas shown on overhead floor layout drawings. be indicated depending on office layout, ceiling tile, and sound attenuation introduced by passive acoustic materials.

1/3 Octave Band Frequency	Octave Band Sound Pressure Level
200	+10 to +14
250	+9 to +12
315	+8 to +10
400	+6 to +9
500	+4 to +7
630	+3 to +4
800	+1 to +2
1000	-1 to 0
1250	-2 to -1
1600	-5 to -3
2000	-8 to -4
2500	-10 to -6
3150	-13 to -8
4000	-16 to -10
5000	-18 to -11

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Part 2.0 System Components

System Components as Supplied by Sound Management Group, LLC. P.O. Box 6060 Hillsborough, NJ 08844

2.1 Master Sound Masking Generator

The generator will consist of a patented* circuit including a solid state digitally calibrated noise source, spectrum shaping filters both fixed and variable, and an amplifier. All connections are via polarized and keyed connectors.

2.1.1 Gain Control

Again control will allow setting the delivered level up to +88 dBA per speaker for use with mineral or glass fiber acoustic ceilings with an STC 36 rating and still deliver up to 52 dBa in the workspace.

2.1.2 Tone Controls

High and low band tone controls for tailoring the spectrum to the required levels for optimum masking. See Curve data for system**.**

2.1.3 Paging Option

Paging input with 500 nominal input impedance and 2VRMS nominal drive level required, 3VRMS max. Paging input is "flat" from 200 Hz to 6 KHz and does not require special pre-emphasis. A single two wire connection to the master will drive all the slaved speakers, thus eliminating duplicate wiring between speakers. See Section 1.4.5.

Note: *When paging is installed as an option, some reduction in the number of speakers per master may be required.*

2.1.4 Dimensions

The master control is 3"(7.62cm)H x 4" (10.16cm)W x 6" (15.24cm)L exclusive of mounting ears, control knobs and connectors. The mounting plate size is 6.5"(16.51cm)W x 8.75" (22.23cm) L.

2.2 Speaker Units

2.2.1 Acoustic Specifications

The speaker unit is rated to 2 watts and is designed to deliver up to an 88dBA level of sound when measured at four feet, axially from the speaker. A uniform spectrum of modified pink noise with speaker to speaker variation at less than ± 2dB over any 1/3 octave band will be assured. For spectrum curves see curve data. The nominal response range is from 200Hz to 6KHz. The System is designed to deliver acceptable (44 to 52 dBa, with 48dBa optimal) at 48" above the floor to the workspace through very highly attenuative ceilings where the single pass STC rating approaches 40 dB.

2.2.2 Speaker Mounting

The speaker mounting shall be by means of the supplied single S-jack chain and eye hook. The nominal 3' chain assures uniform dispersion of the sound provided the interior plenum space is 48" high minimum with speakers on 16 foot centers maximum. Sound Management Group will advise on spacing configurations on plenums under 48" in height.

2.2.3 Speaker Connections

The interconnecting means built into the speaker allow for easy inter-wiring with pre-wired polarized connectors, thus saving installation time and preventing wiring errors. These connectors allow either "daisy chained" or "branched" speaker wiring, to give flexibility in installing wiring.

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2.2.4 Speaker Level Control
Each speaker has a individual level control which is nominally set at 80% during initial installation. This control is used to balance the delivered dB level of the system to within ± 1dB variance. The level control is additionally used in instances where speakers are placed by nearby air returns or other low or high STC ceiling elements cause level fluctuations. Additionally, special requirements may override the normal speaker placements and this control will again be used.

2.2.5 Speaker Dimensions
The speaker size is 6" (15.24cm) Diameter x 7" (17.78cm) high, approx. exclusive of mounting eye bolt, control knob, etc.

2.3 Wiring
All wiring shall consist of jacketed 18 Ga. Teflon or equivalent "low smoke" producing wire to NEC 725b Class 2.

2.3.1 Speaker Wiring
The speaker wiring shall have polarized two pin IDC connectors at each end with the nominal length of 20' being standard. Custom lengths are to be provided as required.

2.3.2 Transformer Wiring
The transformer wiring shall have a polarized five pin IDC connector at the master control end, a spade connector configuration will be assembled for the transformer end of the wire set.

2.3.3 Paging Wiring
The paging wiring using the optional connector consists of a polarized three pin IDC connector and the same Teflon wire as previously specified. Recommended product consultation and specific application notes will facilitate the implementation of the paging system. A shielded wire set is not required due to the paging voltages being at 2 to 3 v RMS typical.

2.4 Transformer

2.4.1 Transformer Type
The transformer supplied will be rated to NEC Class 2 construction for continuous duty to power limited circuits.

Note: *Use of any other type of transformer will void all warranties and can cause damage to the sound masking system as well as to the property of the owner.*

2.4.2 Electrical Ratings
The electrical ratings on the transformer are:
Primary 115V 50/60Hz Secondary 24V 40VA

2.4.3 Transformer Connections
The primary connections to the transformer will be via the attached 6" wire leads to wire nuts into the previously installed 115V 15 amp circuit on the panel or junction box. The transformer metal case shall be grounded via the ground screw. The secondary connections will be by screw terminals to 18 Ga. jacketed power cable. See section 2.3.2.

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Part 3.0 – Execution

3.1 Surface Conditions

3.1.1 Inspection

3.1.1.1
Study building drawings and visit the job site for the purpose of familiarizing with project condition.

3.1.1.2
Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where the installation may properly commence.

3.1.1.3
When encountered during the process of installation, existing active services such as electrical, heating, ventilation, and air conditioning equipment, etc. shall be protected as required and coordinated with trades for the proper execution of the work without disturbing the operation of such services.

3.2.1 Primary Power Supply

3.2.1.1
Provide power per section 1.2.2

3.2.1.2
The AC circuits will be for the sole use of the masking 40 volt transformer circuits and will be switchable at a circuit breaker panel.

3.2.2 AC Step-Down Transformers

3.2.2.1
Provide primary voltage AC 110-120 step-down 40 volt transformers for power to the master control unit(s). A plug-in transformer may also be used where it is in a secure place.

3.2.2.2
Hard Wire required step-down transformers to input electrical circuit located in electrical closet utility panel

3.2.3 Plenum Speakers

3.2.3.1
Plenum speakers shall be located and installed as indicated on the contract drawings and be positioned to avoid interference with HVAC, mechanical, lighting, and structural features of the space.

3.2.3.2
The units shall be suspended from the structure on the supplied chain for clearances as indicated in the enclosed drawings. In certain cases, it will be necessary to locate the speaker units away from obstructions. The relocation should be no more than a three foot radius from the original location and should be marked on the plans for reference.

3.2.3.3
All equipment should be firmly held in place as field conditions dictate

3.2.4 Wiring

3.2.4.1
All low voltage wiring between units shall be Teflon per section 2.3 or as approved by local electrical codes.

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3.2.4.2
Wiring shall be secured to the eye bolt at the top of the speaker with a wire-tie to prevent the IDC connector from being pulled free from the speaker pin connection.

3.2.4.3
The wiring from each zone where designated terminating at the electrical closet shall be clearly labeled as to the circuit and zone number corresponding to the circuit and zones marked on the location plans

3.2.4.4
The contractor shall take adequate precautions to prevent electromagnetic and electrostatic interference and hum. Low voltage wiring shall be separate from power wiring.

3.2 Installation

3.2.1
The contractor shall test each circuit and unit for proper operation.

3.3 System Tests

3.3.1
The contractor shall test each circuit and each unit for proper operation

3.3.2
Upon completion of the entire installation and tests described in this section, the contractor shall notify in writing the architect/ owner that the system is operational according to the specification.

3.3.3
The owner's acoustical consultant or factory authorized representative will adjust the system to establish appropriate level characteristics and uniformity within ± 1dBa, in achieving proper speech privacy equipment noise isolation. During documentation and calibration, any changes or corrections shall immediately be rectified within 7 days by the contractor.