

MASTERFORMAT™ 2020 EDITION SECTIONS

27 51 19 – SOUND MASKING SYSTEMS

NOTE TO SPECIFIER

LOGISON® ACOUSTIC NETWORK – NETWORKED SOUND MASKING, PAGING AND MUSIC SYSTEM

The basis for this specification is the LogiSon Acoustic Network manufactured by K.R. Moeller Associates Ltd.

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1 GENERAL

1.01 SECTION INCLUDES

- .1 Sound masking systems
- .2 Paging systems [Optional]

1.02 REFERENCES

- .1 Reference Standards
 - .1 UL/CSA/EN/IEC 62368-1: Audio/video, information and communication technology equipment – Part 1: Safety requirements.
 - .2 IEC 60065: Standard for Audio, Video and Similar Electronic Apparatus – Safety Requirements.
 - .3 ICES-003 (Industry Canada): Interference-Causing Equipment Standard.
 - .4 UL 1310: Standard for Class 2 Power Units.
 - .5 CSA CMP 75C FT6: Communications cable intended for use within buildings in ducts or plenums or other spaces used for environmental air.
 - .6 UL 2043: Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces; 1996.
 - .7 RoHS: Restriction of Hazardous Substances Directive 2011/65/EU.
 - .8 ASTM E1573-22: Standard Test Method for Measurement and Reporting of Masking Sound Levels Using A-Weighted and One-Third-Octave-Band Sound Pressure Levels.
 - .9 IEC 61672:1-2013: Electroacoustics - Sound level meters - Part 1: Specifications
 - .10 IEC 60942:2017: Electroacoustics - Sound calibrators

1.03 SUBMITTALS

- .1 Product Data: Submit for each system component specified.
- .2 Manufacturer Instructions: Provide manufacturer's manuals for installation, startup and configuration.
- .3 Shop Drawings: Provide the system design on an architectural floor plan showing the quantity, type and location of components, cabling, and accessories.

1.04 CLOSEOUT SUBMITTALS

- .1 Warranty Documentation. Provide warranty documentation, with start date(s) and service contact(s).
- .2 Record Documentation: Provide as-built system design on an architectural floor plan showing the quantity, type and location of components, cabling, and accessories.
- .3 System Reports: Provide reports in electronic form, including:
 - .1 Provide Acoustic Network Manager Report.
 - .2 Provide TARGET Tuning Report.
- .4 System Settings Backup: Provide an electronic backup file (*.lsx) of all system settings.
- .5 Security Items:
 - .1 Provide one set of keys for each locked equipment enclosure.
 - .2 Provide passwords to access control functions for hardware and software user interfaces.

1.05 QUALITY ASSURANCE

- .1 Obtain required permits.
- .2 Follow applicable codes, including regulatory testing and certifications.
- .3 Source all sound masking equipment from a single manufacturer and authorized representative.
- .4 Have the system designed by an authorized manufacturer representative.
- .5 Ensure the installation contractor has received instruction on the specified products.
- .6 Have the system configured and tuned by an authorized manufacturer representative or their approved contractor.
- .7 Ensure supplementary materials meet applicable standards.

1.06 DELIVERY, STORAGE AND HANDLING

- .1 Protect equipment from moisture during shipping, storage, and handling.
- .2 Deliver in manufacturer's original unopened and undamaged packages with manufacturer's labels legible and intact.
- .3 Inspect manufacturer's packages upon receipt.
- .4 Handle packages carefully.

1.07 WARRANTY

- .1 Provide manufacturer's written product warranty covering sound masking components for defects in parts or assembly for a 5-year period from date of system startup.
- .2 Provide a written 1-year installation warranty.

2 PRODUCTS

2.01 PRODUCT & MANUFACTURER

- .1 Basis of Design: LogiSon Acoustic Network (K.R. Moeller Associates Ltd.); Email: info@logison.com; Web: www.logison.com; Distribution: www.logison.com/support/find-your-rep

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2.02 REGULATORY TESTING AND CERTIFICATIONS

- .1 Provide system components conforming to and labelled for:
 - .1 Safety and Electrical: IEC 60065 or 62368-1
 - .2 Electromagnetic Interference (EMI): ICES-003
 - .3 Plenum Rated Cabling: CSA CMP 75C
 - .4 Heavy Metals: RoHS
 - .5 Low Voltage Power Supplies: UL 1310 or 62368-1 Annex

2.03 DESIGN AND PERFORMANCE REQUIREMENTS

- .1 System Design
 - .1 Design system in accordance with manufacturer's specifications.
 - .2 Design system to cover:
 - .1 Areas indicated on the attached system design.
- .2 Masking Sound Control
 - .1 Provide local control zone(s):
 - .1 Covering areas with common acoustical conditions (area type, interior finishes, and occupant function), loudspeaker installation method, and specified masking sound spectrum and level.
 - .2 For each closed room.
 - .3 Not exceeding 3 loudspeakers in open plan.
 - .4 Conforming to the attached system drawings

2.04 ADDITIONAL REQUIREMENTS

- .1 Aesthetics for Open Ceiling Installation
 - .1 Provide braided steel cable for loudspeaker suspension.
 - .2 Provide hubs, loudspeakers and cabling in [white] [charcoal] [a combination of white and charcoal as per system design].

3 EXECUTION

3.01 EXAMINATION

- .1 Ensure that the site is at a stage suitable for the system installation.
- .2 Ensure that the site is constructed according to plans including wall locations, ceiling types and plenum barriers.
- .3 Ensure planned power sources have been provided.
- .4 Ensure planned space is available for centrally located components.
- .5 Ensure third-party components interfacing with the system have been provided.

3.02 INSTALLATION

- .1 Follow manufacturer's installation manual.
- .2 Follow the system design for location of system components and wiring.
- .3 Record any necessary changes to the system design on the plan.

3.03 SITE QUALITY CONTROL

- .1 Ensure plenum height meets manufacturer's minimum specifications.
- .2 Ensure the distance between the top of the loudspeaker and the deck meets manufacturer's minimum specifications.
- .3 Suspend loudspeakers in a level manner.
- .4 Minimize obstructions to loudspeakers.
- .5 Support cables properly in the ceiling.
- .6 Securely terminate cables.

3.04 SYSTEM STARTUP AND COMMISSIONING

- .1 Follow manufacturer's manuals for system startup.
- .2 Follow manufacturer's manuals for system configuration, according to Owner requirements, including timer, audio, occupant controls, diagnostic, and security functions.
- .3 Masking Sound Level Tuning
 - .1 Follow manufacturer's manuals for tuning using LogiSon TARGET software.
 - .2 Set each local control zone to the appropriate overall level.

| Area Type | Overall Level (A-Weighted Decibel) |
|----------------|---------------------------------------|
| Open Office | 47.0 |
| Private Office | 43.0 |
| Meeting Room | 42.0 |
| Corridor | 47.0 |
| Reception Area | 47.0 |

- .3 Set each local control zone to the masking sound spectrum.
- .1 For spectra at different overall levels, adjust target band levels by 1 decibel for each A-weighted decibel change in overall level.
 - .2 Exclude band if its upper tolerance level is less than the documented lower measurement threshold for the model of sound level meter used.

Masking Sound Spectrum (45.0 A-Weighted Decibel Overall Level)

| Band Center Frequency (Hertz) | Target Band Level (Z-Weighted Decibel) |
|----------------------------------|---|
| 100 | 46.9 |
| 125 | 45.9 |
| 160 | 44.7 |
| 200 | 43.9 |
| 250 | 42.7 |
| 315 | 41.4 |
| 400 | 40.4 |
| 500 | 38.9 |
| 630 | 37.4 |
| 800 | 35.4 |
| 1,000 | 33.7 |
| 1,250 | 31.4 |
| 1,600 | 29.4 |
| 2,000 | 27.4 |
| 2,500 | 24.9 |
| 3,150 | 22.4 |
| 4,000 | 19.4 |
| 5,000 | 16.4 |
| 6,300 | 13.0 |
| 8,000 | 9.0 |
| 10,000 | 5.0 |

Source: Optimum Masking Spectrum from National Research Council of Canada Research Report (RR-266).

- .4 Tune the masking sound spectrum and levels with:
- .1 Ceilings fully installed.
 - .2 All furnishings in place.
 - .3 No occupant noise during measurements.
 - .4 Building systems operating at normal daytime settings, provided their noise levels do not interfere with tuning; that is, for the tuning tolerances stated in 3.04.3.9, they are at least 4.5 decibels below the target masking level in each 1/3-octave band and at least 9.8 A-weighted decibels below the target overall masking level.

- .1 In the event of interfering levels, tune with building systems off or at the lowest noise-producing setting.
- .5 Upon arrival on site and prior to conducting measurements, calibrate the sound level meter to 94.0 decibels, using an IEC 60942 certified Class 1 calibrator.
- .6 Select a tuning location within each local control zone that reflects the seated position of an occupant in open plan areas or that of the primary occupant in a closed room.
 - .1 Mark the tuning location precisely on the as-built system design.
 - .2 Assign the tuning location an alphanumeric ID.
- .7 Immediately prior to tuning, measure and record the existing background noise levels at the tuning location.
 - .1 Conduct a 1/3-octave sound level measurement, according to ASTM E1573-22, with the masking sound off at all loudspeakers affecting levels in the tuning location.
 - .2 Calculate the overall level of bands within the sound masking spectrum.
 - .3 Identify interfering levels in the existing background noise.
- .8 Adjust the masking sound levels at each tuning location with the masking sound in surrounding local control zones on and tuned, or pre-tuned to levels generally not more than 2 decibels below those specified.
- .9 Adjust the masking sound levels at each tuning location to conform to the spectrum and overall level specified, so that, when the local control zone is tested according to subparagraph 3.04.3.10:
 - .1 The level in each 1/3-octave band is within plus or minus two decibels (+/- 2.0 dB) of the target band level, unless existing background noise interferes.
 - .2 The overall level of bands within the sound masking spectrum is within plus or minus one half A-weighted decibels (+/- 0.5 dBA) of the specified overall level, unless existing background noise interferes.
- .10 Upon completion of tuning each local control zone, measure and record the final masking sound levels, according to ASTM E1573-22.
- .11 Modify the tuning, system design, or installation, at the supplier's expense, until conformity in each local control zone is achieved, unless existing background noise interferes.
- .4 Provide an electronic report of testing and tuning data, including:
 - .1 TARGET Tuning Report.
 - .2 As-built system design(s) showing all tuning locations and local control zones.
 - .3 Explanation of each final masking sound level measurement which exceeds tolerances for the spectrum or overall level.
 - .4 Description of test instrumentation.

3.05 CLEANING AND WASTE MANAGEMENT

- .1 Remove empty packaging and other material waste.
- .2 Clean system components where required.

3.06 CLOSEOUT ACTIVITIES

- .1 Demonstrate operational system to Owner representative.
- .2 Review closeout submittals with Owner representative.
- .3 Train Owner representative to maintain system and use occupant controls or interfaces.
- .4 Review service and support contacts.

3.07 ATTACHMENTS

- .1 System Design: The system design on an architectural floor plan showing the quantity and location of components and loudspeakers, and the size and location of local control zones.

END OF SECTION