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PART 1 - GENERAL

1.1 REFERENCES

- .1 Canadian Standards Association (CSA International)
  - .1 CAN/CSA C22.1 No.126.1-02, Metal Cable Tray Systems.
  - .2 CAN/CSA C22.1 No.126.1-02, Non Metallic Cable Tray Systems.
- .2 National Electrical Manufacturers Association (NEMA)
  - .1 NEMA FG 1-1993, Fiberglass and Cable Tray Systems.
  - .2 NEMA FG 1-2002, Metal Cable Tray Systems.
  - .3 NEMA FG 2-2001, Cable Tray Installation Guidelines.

1.2 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Product Data: submit manufacturer's product data sheets for cable tray indicating dimensions, materials and finishes, including classifications and certifications.
- .3 Shop drawings: submit shop drawings showing materials, finish dimensions, accessories, layout and installation details.
- .4 Identify types of cabletroughs used.
- .5 Show actual cabletrough installation details and suspension system.

1.3 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

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1.4 SYSTEM  
DESCRIPTION

- .1 Empty telecommunications raceways system consists of outlet boxes, RPVC conduits to accessible ceiling space, cabletroughs, pull boxes, sleeves and caps, fish wires, service poles and service fittings.
- .2 Overhead Cabletrough distribution system.

1.5 WASTE  
MANAGEMENT AND  
DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, corrugated cardboard packaging for recycling in accordance with Waste Management Plan.
- .4 Divert unused wiring materials from landfill to metal recycling facility as approved by. Departmental Representative.

PART 2 - PRODUCTS

2.1 CABLETROUGH

- .1 Cabletroughs and fittings: to NEMA VE1 and CAN/CSA C22.1 No. 126.2.
- .2 Ladder type, Class as required to CAN/CSA 22.2 No. 126.2.
- .3 Trays: galvanized steel 305mm width with depth of 103mm.
- .4 Minimum rung spacing 150mm.
- .5 Fittings: horizontal elbows, end plates, dropouts, vertical risers and drops, tees and manufactured accessories for cabletrough supplied. 1. Radii on fittings: as required.
- .6 Solid coverings for complete cabletrough system including fittings.

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2.1 CABLETROUGH  
(Cont'd)

- .7 Ground cable trays with #6 AWG bare copper conductor attached to each tray section in accordance with CEC requirements.
- .8 Provide fire stop material at firewall penetrations.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Install complete cabletrough system in accordance with NEMA VE 2.
- .2 Support cabletrough on both sides.
- .3 Remove sharp burrs or projections to prevent damage to cables or injury to personnel.

PART 1 - GENERAL

1.1 SECTION INCLUDES.1 Sounds masking systems

- 1.2 REFERENCES
- .1 UL6500 - Standard for Audio/Video and Musical Instrument Apparatus for Household, Commercial and Similar General Use.
  - .2 UL 2043 - Standard for Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces; 1996.
  - .3 ASTM E 1374-02 - Standard Guide for Open Office Acoustics and Applicable ASTM Standards.
  - .4 ASTM E 1573-02 - Standard Test Method for Evaluating Masking Sound in Open Office Using A-Weighted and One-Third Octave Band Sound Pressure Levels.
  - .5 ASTM E 1130-02e1 - Standard Test Method for Objective Measurement of Speech Privacy in Open Offices Using Articulation Index.
  - .6 FCC - EN 55103-1&2 - Audio, Video and Entertainment Lighting Control.

- 1.3 PERFORMANCE REQUIREMENTS
- .1 General performance:
    - .1 The sound masking and paging system shall be digitally adjustable by remote control at each distributed master unit.
    - .2 Output settings shall be saved in non-volatile memory in each master unit.
  - .2 Sound masking performance:
    - .1 The masking sound shall be random and provide no noticeable repetitive pattern.
    - .2 The masking sound shall be provided by independent generators included in each master unit, no more than four (4) speakers per zone.
    - .3 The master units shall provide fine digital masking spectrum adjustment with 100 or more preset curves, capable of adjusting zones of 1 to no more than 3 speakers.
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1.3 PERFORMANCE  
REQUIREMENTS  
(Cont'd)

- .2 Sound masking performance:(Cont'd)
  - .4 The masking volume shall be digitally adjustable in increments of no more than 0.5 dBA at each master unit (controlling 1 to no more than 3 speakers), over a range of at least 45 dBA @ 1m.
  - .5 The central volume control shall provide at least a 20 dBA volume range.
  - .6 After adjustment, the system shall provide a spatial uniformity of  $\pm\frac{1}{2}$  dBA for the masking volume with furnishings in place.
- .3 Timer performance:
  - .1 The timer shall enable masking volume levels to be automatically adjusted according to a programmed schedule or schedules.
  - .2 The timer shall be calendar-based.
  - .3 The timer shall provide automatic daylight saving time adjustments.
  - .4 The timer shall provide an acclimatization process that automatically increases the masking volume over a period of time according to a user programmed schedule. The system should allow for independent acclimatization schedules for each timer zone.
  - .5 The timer shall provide at least four independent timer zones.
  - .6 The timer shall allow independent timer schedules for each day of the week.
  - .7 The timer shall allow variable rates of volume adjustment.
  - .8 The system shall allow for hardwired timer zones independent of paging zones.
- .4 Security performance:
  - .1 The timer shall be contained in a key locked metal enclosure.
  - .2 Access to the timer functions shall be password protected.
  - .3 No physical controls shall be located on the master units, to prevent tampering.
  - .4 Master units shall provide configuration mode protection via an activation password.

1.4 SUBMITTALS

- .1 Product Data: Manufacturer's specifications and installation instructions.
- .2 System Design: Schematics of the system showing quantity and location of system components and related cabling and accessories.

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- .3 Warranty Documents: Warranty documents covering the system components.

#### 1.5 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Minimum of 10 years manufacturing sound masking systems.
- .2 System Design - Performed by an approved manufacturer representative.
- .3 Installer Qualifications - Approved by manufacturer representative and are trained with the specified products or have demonstrated experience with the installation of similar products to those specified.
- .4 System Adjustment - Done by an approved manufacturer representative or trained contractor.
- .5 Single Source Responsibility - Source master units, central volume control master units, satellite units, remote controls, and timers from a single manufacturer.

#### 1.6 DELIVERY, STORAGE AND HANDLING

- .1 Protect 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.

#### 1.7 WARRANTY AND MAINTENANCE

- .1 Provide a written warranty that products installed shall be free from defects in parts or assembly for a 5-year period from date of completion of installation.

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PART 2 - PRODUCTS

- 2.1 MANUFACTURERS .1 Acceptable manufacturer:
- .1 Atlas Sound
- .2 Substitutions: Engineer approved equal.
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- 2.2 SYSTEM COMPONENTS .1 General System Overview: The sound masking and paging system shall be a decentralized system with digital output adjustment at each master unit via remote control. The system shall be comprised of a selection of 1) Atlas Sound Model #AA120 Amplifier; 2) Atlas Sound Masking Generator #TSD-GPN1200; 3) Atlas Sound Masking Loud Speakers #M1000R-W; and 4) Atlas Sound volume control #AT35. System to be supplied with all necessary components and hardware.
- .1 Sound masking amplifier:
    - .1 120W six (6) input channel mixer.
    - .2 Pre-assembled unit for general purpose with the following built-in features:
      - .1 Five (5) mic inputs w/ phantom power.
      - .2 One (1) stereo aux line input.
      - .3 Input 1 has VOX send.
      - .4 Dual line output.
      - .5 Pre out/power in patch.
      - .6 Remote and VOX activated mute.
      - .7 Zone 2 (MOH out) 1 watt @ 8.
    - .3 Acceptable manufacturer or approved equal:
      - .1 Atlas Sound #AA120
  - .2 Sound masking generator:
    - .1 Pre-assembled unit for general purpose with the following built-in features:
      - .1 Analog typology.
      - .2 Balanced output.
      - .3 Selectable between pink and white noise.
      - .4 Variable gain.
      - .5 Variable hi-cutoff filter.
      - .6 Stand alone or rack mountable.
      - .7 Rear panel adjustments.
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- 2.2 SYSTEM COMPONENTS  
(Cont'd)
- .1 (Cont'd)
  - .2 Sound masking generator:(Cont'd)
    - .2 Acceptable manufacturer or approved equal:
      - .1 Atlas Sound #TSD-GPN1200
  - .3 Speakers:
    - .1 8" dual cone.
    - .2 Pre-assembled unit for general purpose with the following built-in features:
      - .1 Loudspeaker.
      - .2 Transformer.
      - .3 Enclosure.
      - .4 Baffle.
      - .5 Mounting hardware.
    - .3 Suitable for use above suspended ceiling space.
    - .4 Acceptable manufacturers or approved equal:
      - .1 Atlas Sound #M1000R-W
  - .4 Volume control:
    - .1 Power rating: 35W.
    - .2 Attenuation step: 3dB.
    - .3 Total attenuation: 27dB.
    - .4 Suitable for installation in single gang box.
    - .5 Acceptable manufacturer or approved equal:
      - .1 Atlas Sound #AT35.

### PART 3 - EXECUTION

- 3.1 SYSTEM DESIGN
- .1 Design system according to manufacturer's specifications.
- 3.2 EXAMINATION
- .1 Ensure that facility build out is at a stage suitable for the system installation.
  - .2 Ensure that facility is constructed according to plans including wall locations, ceiling types and plenum barriers.
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- .3 Ensure that the plenum height is appropriate as per manufacturer's recommendations and as per plan.
- .4 Ensure power requirements have been provided as per plan.
- .5 Ensure sufficient space for centrally located components is available as per plan and manufacturer's specifications.
- .6 Ensure any third-party components required to be interfaced with the system have been provided.

### 3.3 PERMITS

- .1 Obtain necessary permits for installation work.

### 3.4 INSTALLATION

- .1 Follow all applicable codes for the area.
- .2 Follow manufacturer's recommendations regarding installation.
- .3 Follow the system design for location of loudspeakers and wiring.
- .4 Record any necessary changes to the system design on the plan.
- .5 Ensure that supplementary materials used meet applicable safety standards.

### 3.5 FIELD QUALITY CONTROL

- .1 Ensure that plenum heights meet the minimum recommended by the manufacturer for the
- .2 Ensure that distance between the top of the loudspeaker and the deck meets manufacturer's minimum specifications.

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| <u>CONTROL<br/>(Cont'd)</u>               | .3 | Ensure that loudspeakers are not obstructed as much as possible.                      |
|   | .4 | Ensure cables are properly supported in the ceiling.                                  |
|   | .5 | Ensure cables are securely terminated.  |
| <br>                                      |    |   |
| <u>3.6 SYSTEM<br/>ADJUSTMENT</u>          | .1 | Follow manufacturer's recommendations for   |
| <br>                                      |    |   |
| <u>3.7 CLEANING</u>                       | .1 | Ensure that empty packaging is removed.   |
|   | .2 | Ensure that any material waste is removed.  |
|   | .3 | Ensure the product is clean and presentable where required.                           |
| <br>                                      |    |   |
| <u>3.8 DEMONSTRATION<br/>AND TRAINING</u> | .1 | Demonstrate operational system to customer by   |
|   | .2 | Demonstrate functionality of the system to the customer or customer's representative. |
|   | .3 | Train customer employee to maintain system as required.                               |
| <br>                                      |    |   |
| <u>3.9 TESTING AND<br/>REPORTING</u>      | .1 | Test area for consistency of masking volume   |
|   | .2 | Verify that paging zoning and levels are appropriate and as per plan.                 |
|   | .3 | Test masking volumes with mechanicals off and with space unoccupied.                  |
|   | .4 | Provide a printed report detailing system settings.                                   |