Part 1 General

1.1 ADDENDUM FORM

.1 This Addendum forms part of the Contract Documents and modifies the Bidding Documents dated 18 May 2017 with amendments and additions noted below.

.2 Acknowledge receipt of this Addendum in the space provided in the Bid Form. Failure to do so may disqualify the Bidder at the Owner's discretion.

.3 This addendum consists of eight (8) pages:

1.2 PARTITION TYPES

.1 A2.0 CONSTRUCTION PLAN – SECOND LEVEL

.1 Construction and installation of steel mesh in partition types P1 and P3 have been completed as per the drawing package.

.2 The dry erase finish in rooms 226 and 230 shall cover the fill height of the specified wall. Prepare wall to level 5 finish.

1.3 SPECIFICATIONS

.1 ACOUSTIC PANEL CEILINGS 09 51 13

.1 Acoustic Ceiling Tile size to be 24 x 48 inches

1.4 SCHEDULES

.1 Luminaire Schedule

.1 Revise Note 2 to "Not Used".

.2 Type C luminaire lengths shall be coordinated with the millwork. The luminaire shall not protrude from under the counter.

1.5 CLARIFICATIONS

.1 ACOUSTIC INSULATION CLARIFICATION

.1 Question: Also clarify if wall insulation needs to be Roxul or is fibreglass OK?

.2 Response: No. Please bid as per specification documents.

1.6 SPECIFICATIONS

.1 Refer to 27 51 18 Sound Masking (included herein)

.2 Add specification section included herein. See attached.

1.7 CLARIFICATIONS

.1 All work listed under "Landlord" scope is the responsibility of the Landlord. The Contractor shall carefully review all contract documents, as the scope division has been revised in the addendum process, transferring an additional scope of work under this contract.

.2 Clarification on Addendum #1 Item 1.8.3 (Scope of work "D" on drawing E1.0): The line item required the Landlord demolish the services that were at the demarcation line between the Landlord and the Tenant. The Landlord provided the walls along the perimeter of the Tenant space. Failure to address the above demolition by the Landlord would've required the Contractor to damage the walls that were prepared by the Landlord, then patch / repair the same perimeter walls once the demolition work is done. To avoid this, the demolition scope on the interior of the Tenant walls was transferred to the Landlord's scope of work.

.3 Contractor to coordinate and route 2x2" EMT conduit from the new communication room to the demarcation point in Electrical Rm 123. This electrical room is located on the ground floor by GL-N and GL-1. The contractor is responsible for verification of this information on site. No extras will be entertained.

END OF ADDENDUM NUMBER NO. 5

Part 1 General

1.1 DESCRIPTION OF WORK

.1 The work of this Section consists of the provision of all plant, materials, labor and equipment and the like necessary and/or required for the complete execution of all Sound Masking System and related work for this project, as required by the schedules, and keynotes and drawings.

.2 Functional Requirements of Systems:

.1 Distribute sound masking to all areas as indicated on the drawings.

.2 Refer to the System Testing and Adjustments for additional system performance requirements.

.3 All active electronic components shall be conveniently accessible for service. Systems using above-ceiling active electronics are not permitted.

.4 Definitions:

.1 Privacy Index: According to American Society of Testing and Materials (ASTM) Standard E1130.

.2 Octave and 1/3-Octave Bands: Centered on ANSI/ISO preferred frequencies.

.3 Sound Level Meter and Filter Set: Calibrated ANSI Type 1 or Type 2.

.4 Pink Noise: Constant energy in constant percentage (e.g. 1/1 or 1/3 octave) frequency bands, random or pseudo-random noise.

.5 SPL: Sound pressure level in dB re 0.00002 Pa (0.0002 microbar).

.6 ISO: International Standards Organization

.7 CEC: Canadian Electrical Code

.8 UL: Underwriters Laboratories

1.2 QUALITY ASSURANCE

.1 To be considered qualified for this work, the sound masking system supplier must be experienced in the provision of sound systems similar in complexity to those required for this project, and meet the following:

.1 The Contractor's primary business is the provision, fabrication, and installation of distributed sound and related systems.

.2 The Contractor is an authorized dealer for the major product components furnished.

.2 System Design: Performed by a representative or dealer approved by the manufacturer based on the specific products.

.3 Commissioning: Performed by a representative or dealer approved by the manufacturer.

1.3 SUBMITTALS

.1 All submissions, unless otherwise noted, shall be in Adobe PDF format.

.2 Unless otherwise directed by contract, do not procure the equipment until the shop drawings have been reviewed and approved by the Owner and the Engineer.

1.4 WARRANTY

.1 Warrant all equipment to be free of faulty workmanship and defects and from damage due to contamination by construction dust and debris for a minimum period of one year from date of final acceptance for control modules and five years from date of final acceptance for loudspeakers.

1.5 SERVICE CONTRACT

.1 Provide a one-year service contract to commence after acceptance of installation without additional cost. Service to include two semi-annual visits to the site for routine adjustment and maintenance of all equipment. Provide a preliminary schedule for the semi-annual visits.

1.6 TRAINING

.1 The Owner may assign personnel to participate with the contractor during installation. Without delaying the work, familiarize the Owner's personnel with the installation, equipment, and maintenance.

.2 During tests and adjustments, permit the Owner's personnel to observe. When feasible explain the significance of each test.

.3 Provide sufficient training to personnel selected by the Owner on operation and basic maintenance of all systems and equipment. Explain operation of control systems, set-up and operation of individual pieces of equipment, and functions of overall systems.

Part 2 Products

2.1 GENERAL

.1 The loudspeakers shall be direct field, radiating directly into the space.

.2 The sound masking system shall have controllers that power one or more individually controllable zones. The system shall provide:

.1 One or more rack or wall-mounted controllers, each with one or more zones and one or more line level audio inputs.

.2 Four uncorrelated noise sources per zone. The signals to adjacent loudspeakers shall be uncorrelated.

.3 Direct field loudspeakers that automatically sequence the four noise channels and that are mounted either in office ceiling tiles or other enclosures.

.4 Pre-terminated cable assemblies, as per equipment manufacturer's recommendations.

2.2 LABELS

.1 Except where otherwise specified, label each item of control equipment.

.2 Identify all wires and cables at every connection point to controllers with reference number keyed to the as-built wiring diagrams.

.3 Room numbers appear on the contract documents for reference only. All labels shall reflect the Owner's final room designations.

.4 Cable Markers:

.1 High-grade PVC clip-on or permanent-type cable markers with permanent markings, or printed vinyl tape protected by clear shrink tubing or adhesive wrap.

2.3 MANUFACTURERS

.1 Acceptable Manufacturer: Cambridge Sound Management or approved equals.

2.4 CONTROLLERS

.1 All sound masking loudspeakers shall be directly powered and managed by a controller.

.2 Each controller and zone shall:

.1 Have four button control and LCD readout of system settings on front panel.

.2 Provide DSP-based sound generation with four (4) uncorrelated masking signal outputs per zone.

.3 Have built in signal logic for sequential channel operation by adjacent loudspeakers.

.4 Provide pre-set industry standard frequency equalization, specifically tailored to the operating characteristics of the loudspeaker or speakers provided and requiring no frequency equalization during the commissioning process.

.5 Provide separate level controls for masking and paging/music adjustable in 1 dB steps over a minimum range of 30 decibels, and off.

.6 Have dedicated compressor and peak limiter for paging inputs.

.7 Be wall and/or rack mountable (except single zone controllers wall mountable only).

.8 Have UL/CUL/CE listed power supply.

.9 Be Green Spec-Listed for energy efficiency.

.3 Single-Zone Controllers:

.1 Capable of controlling a single zone of sound masking, from 1 to 120 speakers and 100 to 12,000 square feet.

.2 One audio input on rear panel operable in balanced or single ended configuration for distribution of externally generated signals via 4 terminal compression type connector.

.3 Optional Bluetooth wireless control connectivity for automated control of masking level setting during system commissioning.

.4 Wall mountable.

.5 Minimum Performance Requirements:

.1 Supply Power: 110 – 240 VAC 0.9 Amperes.

.2 Rated ambient temperature range: 40 to 90 degrees F (4 to 32 degrees C).

.3 Output Voltage: 20 volts RMS minimum sine wave at full load, each channel to meet NEC Class 2 requirements for low voltage distribution.

.4 Audio (paging) input: 600 ohm line bridging, differential or single ended, 1 volt nominal, adjustable between -10 dBv and +4 dBv RMS.

.6 Acceptable Products:

.1 Cambridge Sound Management Model Qt 100

.2 Bluetooth connectivity Option

2.5 LOUDSPEAKERS

.1 Miniature self-contained ceiling mounted loudspeaker/enclosure/baffle system.

.1 Designed specifically for distributing background masking. Ultra wide dispersion to maximize spatial uniformity.

.2 Plenum rated.

2.6 LOUDSPEAKER CABLING

.1 Loudspeaker cabling shall be in accordance with loudspeaker requirements / recommendations.

Part 3 Execution

3.1 GENERAL

.1 System supplier shall confirm the speaker layout and modify the quantity / location of speakers as required to achieve the optimal system performance.

.2 All types of equipment installed in strict accordance with approved shop drawings and manufacturer's instructions.

.3 All equipment except portable equipment firmly held in place. This shall include loudspeakers, enclosures, amplifiers, cables, etc. Fastenings and supports adequate to support their loads with a safety factor of at least three unless otherwise stated.

.4 All system wiring shall be in conduit unless approved otherwise by the Owner.

3.2 GENERATOR/CONTROLLER:

.1 Locate Generator/Controllers as shown on drawings, and near an available dedicated 110VAC receptacle.

.2 Locate at a convenient location for operation from floor level.

.3 Mount Generator/Controller and Processor securely to wall or other vertical surface with screws or mounting brackets provided.

.4 Attach line level and loudspeaker cables connecting to controllers securely with suitable strain-relief clamps.

.5 Identify all loudspeaker home run wires and cables at termination and connection points with approved cable markers. Label each cable with cable marker keyed to a wiring schedule indicating the corresponding area of building served. Designate building floor level and zone, and whether area served is open plan, enclosed offices, circulation or other.

3.3 LOUDSPEAKERS (in ceiling tiles)

.1 Cut hole in center of each ceiling tile using the hole saw or similar.

.2 Taking care not to visibly distort tile, slip provided locking collar on back of loudspeaker and firmly tighten against ceiling.

.3 Connect cabling to loudspeakers in accordance with the manufacturer's instructions.

3.4 LOUDSPEAKER CABLING

.1 Cabling routed within return air plenums shall be plenum-rated unless installed in conduit.

.2 When using a CAT cable tester, test all field fabricated cables, before installation, for open circuits, shorts, crossed pairs, reversed pairs, split pairs and proper pin-out.

.3 Ensure that the quantity of speakers per home run does not exceed manufacturer's recommendations.

.4 Maximum cable distance between the controller and the furthest speaker shall not exceed manufacturer recommended maximum distance.

3.5 SYSTEM TESTS AND ADJUSTMENTS

.1 Initial Test and Adjustments: Perform and record results of the following tests:

.1 Loudspeaker Operation: Near field output of each loudspeaker shall match the zone average within +/- 1.5 decibels. Listen directly below each installed loudspeaker to confirm it is operating. For any loudspeakers found to be inoperative, or possibly operating at an incorrect level, use a sound level meter set to A-weighting and slow response to check the output. Place the microphone so as to contact each grille.

.2 Replace any defective loudspeakers or cabling, or otherwise correct cause for any loudspeakers found to be operating outside this range.

.3 Buzzes, Rattles, and Distortion: With system operating at maximum level, listen for any buzzes, rattles, and objectionable distortion in all areas covered. Correct all causes of these defects.

.4 Control Settings: Adjust all spectrum and level controls for normal operation. Measure the A-weighted sound pressure level using a sound level meter set to A-weighting and slow response at representative locations within each zone. Adjust average initial levels in open plan areas to 45 dBA at normal occupants' locations and in closed offices or rooms to 42 dBA.

.2 If requested, demonstrate to the Owner's Representative that the system is fully operable and installed in compliance with the terms of the performance specifications hereunder.

.3 Test the system to demonstrate that the design goal of Privacy Index (PI) = 80% (Normal Privacy) or better is met between representative workstations separated by partitions of 66" or greater height. For this test, select adjacent workstation pairs without direct line of sight or significant sound reflecting ceiling or wall elements between, and with a ceiling material rated at NRC of 0.85 or higher. Tests shall be in accordance with ASTM Standard E1130 except that the octave band calculation method of ANSI Standard S3.5 may be used. Lower levels of PI are acceptable only if the ceiling or partition requirements described hereinbefore are not met.

.4 Test the system in each open plan area zone served to demonstrate that the design goal for spatial uniformity is met. Tests shall be carried out per ASTM Standard E1041 as measured in the 2,000 Hz octave band. At each location, the average sound pressure levels shall be measured over an interval of at least 4 seconds at four positions at 90° intervals around a circle of 0.3 m (1 ft) radius centered on the location. The arithmetic mean sound pressure level shall be calculated from the four measured values. For at least 75% of the test locations, the arithmetic mean sound pressure level in the 2,000 Hz octave band shall not vary by more than 1 dB from the average of the arithmetic mean sound pressure levels measured at all locations.

.5 Test the system to demonstrate that the PI is at least 95% (Confidential Privacy) between representative private (enclosed) offices served by the system. For this test, select adjacent offices with closed doors. Tests shall be in accordance with ASTM Standard E1130 except that the octave band calculation method of ANSI Standard S3.5 may be used. Lower levels of PI are acceptable if the common walls between the offices do not extend to the deck above the acoustical ceiling and the ceiling material is not rated at STC 35 or greater. If the PI achieved is lower than 95% and caused by these or other architectural factors, bring this to the attention of the Owner or General Contractor.

END OF SECTION