



CH2000IP Specification - Rev 6

PART 1 – GENERAL

1.01 GENERAL REQUIREMENTS

- A. The conditions of the General Contract (General, Supplementary, and Other Conditions) and the General Requirements are hereby made a part of this Section.
- B. All bids shall be based on the equipment as specified herein. The catalog numbers and model designations are those of the CH2000IP Life Safety Communication Platform. The specifying authority must approve any alternate system.
- C. Contractors who want to submit alternate equipment shall provide the specifying authority with the appropriate documentation at least 15 business days before bid opening. The submitted documentation must provide a feature-by-feature comparison identifying how the proposed equipment meets the operation and functionality of the system described in this specification. The contractor shall provide adequate and complete submittal information before the bid date. Submittal documentation shall include but is not limited to, specification sheets, working drawings, shop drawings, and system demonstrations. The alternate supplier-contractor must also provide a list of six installations identical to the system proposed.
- D. Final approval of the alternate system shall be determined at the time of job completion. Failure to provide the "precise functional equivalent" shall result in the removal of the alternate system at the contractor's expense.
- E. The contractor for this work shall be held to have read all bidding requirements, the general requirements of Division 1 and contract proposal forms and complete the execution of this work. The contractor shall be bound by all conditions and requirements therein.
- F. The contractor shall be responsible for providing a complete functional system including all necessary components whether included in this specification or not.
- G. In preparing the bid, the contractor should consider that no claim will be made against the owner for any costs incurred by the contractor for any equipment demonstrations that the owner requests.

1.02 SCOPE OF WORK

- A. Furnish and install all equipment, accessories, and materials per these specifications and drawings to provide a complete and operating school communications system including, but not limited to:
 - 1. An Administrative Display able to receive call-ins and establish two-way audio communication between call-signaling audio endpoints. Capable of calling and receiving calls from other network-connected administrative consoles, consisting of a map-based GUI (Graphical User Interface) and capable of running on a 22" (or larger) LCD touchscreen computer.
 - 2. Administrative Console with a color touchscreen display and intuitive GUI.

3. Call initiation switches capable of placing normal and emergency calls.
 4. Built-in calendar with configurable time zone (including Daylight Savings Time), unlimited events and supporting a minimum of 80 schedules.
 5. IP-based system software with LAN/WAN access for Voice over IP (VoIP) communications and remote management.
- B. Public Switched Telephone Network (PSTN) or VOIP switch can be connected to the system via an inbound SIP Trunk.

1.03 SUBMITTALS

- A. Specification sheets on all items including cable types.
- B. Shop drawings that detail the integrated electronic communications network system including, but not limited to, the following:
 1. Port wiring arrangement
- C. Wiring diagrams showing typical connections for all equipment.
- D. Numbered Certificate of Completion for installation, programming, and service training, which identifies the installing technician(s) as having successfully completed the technical training course(s) provided by the system manufacturer.

1.04 QUALITY ASSURANCE

- A. All items of equipment shall be designed by the manufacturer to function as a complete system and shall be accompanied by the manufacturer's complete service notes and drawings detailing all interconnections.
- B. The contractor shall be an established communications and electronics contractor who currently maintains and for at least five years has had a locally run and operated business. The contractor shall be a duly authorized distributor of the equipment supplied with full manufacturer's warranty privileges.
- C. The contractor shall show satisfactory evidence, upon request, that he or she maintains a fully equipped service organization that can furnish adequate inspection and service to the system. The contractor shall maintain at his or her facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied. Upon request, the contractor shall show satisfactory evidence that he or she maintains a fully equipped service organization.

1.05 SINGLE SOURCE RESPONSIBILITY

- A. Except where specifically noted otherwise, all equipment supplied shall be the standard product of a single manufacturer of known reputation and with a minimum of 10 years' experience in the industry. The supplying contractor shall have attended the manufacturer's installation and service school. A certificate of this training shall be provided with the contractor's submittal.

1.06 SAFETY/COMPLIANCE TESTING

- A. The mains-powered communications system shall bear the label of a Nationally Recognized Testing Laboratory (NRTL), such as TUV or UL, and shall be listed by their re-examination service. All work must be completed in accordance with all applicable electrical codes under the direction of a qualified and factory-approved distributor with the owner's approval.
- B. The system is to be designed and configured for ease of service and repair.

1.07 IN-SERVICE TRAINING

- A. The contractor shall provide at least eight hours of in-service training with this system. These sessions shall be broken into segments that facilitate the training of individuals in the operation of this system. Operator manuals and user guides shall be provided at the time of this training.

1.08 WIRING

- A. System wiring and equipment installation shall be in accordance with good engineering practices as established by the EIA and the NEC/CSA. Wiring shall meet all local electrical codes. All wiring shall be tested and verified to meet the requirements.
- B. All communication system wiring shall be labelled at both ends of the cable. All labelling shall be based on the designators indicated in the architectural graphics package.

1.09 PROTECTION

- A. The contractor shall provide all necessary transient protection on the AC power feed and all port lines leaving or entering the building.
- B. The contractor shall note in the system drawings the type and location of these protection devices and all wiring information. Such devices are not to be installed above the ceiling.

1.10 SERVICE AND MAINTENANCE

- A. The contractor shall provide a five-year equipment hardware warranty for the installed system against defects in material and workmanship. All materials subject to warranty repair/replacement shall be provided at no expense to the owner during normal working hours. The warranty period shall begin on the date of acceptance by the owner/engineer.
- B. The contractor shall, at the owner's request, make available a maintenance contract offering continuing factory-authorized service of this system after the initial warranty period.
- C. The system manufacturer shall maintain engineering and service departments that are capable of rendering advice regarding the installation and final adjustment of the system.

1.11 USER ROLES AND ACCESS

- A. The system shall include the ability to configure user roles and access for permission-based functionality.

1.12 DATA AND COMMUNICATION ENCRYPTION

- A. The system shall include a minimum of AES-128 encryption for communications and data transfers.

1.13 SUPERVISION

- A. The system shall include supervision of IP endpoints with the ability to alert end users via software and/or automated emails.

PART 2 - EQUIPMENT SPECIFICATION

2.01 MANUFACTURERS

- A. Subject to compliance with requirements specifications, provide the following system:
 - 1. CH2000IP manufactured by CareHawk Inc.
- B. The specifying authority must approve any alternate system.
- C. This specification is intended to establish a standard of quality, function, and features. It is the bidder's responsibility to ensure that the proposed product meets or exceeds every standard outlined in these specifications.
- D. The functions and features specified are vital to the operation of this facility; therefore, inclusion in the list of acceptable manufacturers does not release the contractor from strict compliance with this specification's requirements.

2.02 EQUIPMENT

- A. SYSTEM EQUIPMENT
 - 1. CH2000IP Life Safety Communication Platform Server
 - a. Intel I5 or higher processor
 - b. 99 simultaneous tasks capable of 200 call-ins in the queue
 - c. Linux OS
 - d. CH2000IP software
 - 2. GW2WIP1/GW2WIP2 SIP Enabled POE Gateway
 - 3. GWMIC Omnidirectional Microphone
 - 4. Program Sources
 - a. External audio source interfaced through a 3.5mm connection to a GW2WIP1/GW2WIP2
 - 5. Administrative Equipment
 - a. MapAssistIP Administrative Display Application with map-based user interface
 - b. ADMIN7 Administrative Console

6. Optional Equipment

- a. CLKMSL10(D) Messaging display POE
- b. CLKMSL10(D)-SPK Messaging display with SIP speaker POE+
- c. CLKMSL22A Messaging display (12V, 35W)
- d. DAF100-25/70 100-Watt remote Class D amplifier 25V or 70V (For use with GW2WIP1/GW2WIP2)
- e. DAF300-25/70 300-Watt remote Class D amplifier 25V or 70V (For use with GW2WIP1/GW2WIP2)
- f. VCall+ Mobile application
- g. AS-3B-LWE Alert Station
- h. CS2-C(-FR), CS2-CE(-FR), CS55, CS-D30-IP Call Stations
- i. GPIO-8I-8O Integration Hub (General Purpose Inputs and Outputs)

2.03 COMPONENTS AND DESCRIPTIONS

A. The intercom must support the existing speakers with modification for an IP-based cable infrastructure.

B. CH2000IP

1. The system shall have a maximum of 256 SIP audio endpoints and 16 administrative devices.
2. The system shall be capable of expanding capacity using additional systems.
3. The software shall be upgraded via a web interface. After rebooting the system, the software upgrade is complete. The system shall allow for a manual revert to the previous working software.
4. The system shall facilitate the playing of pre-recorded audio files.
5. The system shall facilitate the live recording, naming, and storage of user-generated audio files.
6. The built-in calendar shall facilitate automatic control of class changes and other events.
7. The system shall be capable of retrieving (“pulling”) calendars from other connected systems as well as sending (“pushing”) a calendar or day schedule from one or more designated systems to a single or multiple connected systems (Mass Calendar Update).
8. The system shall be capable of displaying active calendars from connected systems.
9. Network Time Synchronization. The system shall be capable of synchronizing the time with a Network Time Server running NTP via the school’s LAN network. Systems that cannot provide Network Time Synchronization will not be deemed equivalent.
10. The system shall have user management with configurable permission-based roles and access to system functionality.

C. MapAssistIP Administrative Display Application

1. The system shall show the time of day and date.
2. The system shall provide an option to select the language (English/French).
3. The system shall display a facility map(s)/floorplan(s).
4. The system shall include a tool to create and update facility maps.
5. The system shall highlight, with distinct colors, system communications on the map including intercom, paging, tones, and music distribution.
6. The system shall have the ability to provide Lockdown Acknowledgement per endpoint. This is to be highlighted on the map as the endpoints report back to the system as secure.
7. The system will use a GUI to activate intercoms, security alerts, zone pages, external functions, select program sources, and distribute or cancel the source to any or all endpoints or zones.
8. The system shall allow for the generation of user-created zones and dynamic zone creation.
9. The system shall display call-in extensions/room numbers and the call-in priority of calls placed.
10. The system shall allow for the management of users, roles, and permissions.
11. The system shall allow for the management of user-defined tones and preannounce tones.
12. The system shall facilitate the distribution of configurable email alerts based on triggered tones/events.

13. The system shall be accessible on supported browser-based devices connected to the local network.
14. The system shall enable bi-directional communication with system audio endpoints, MapAssistIP, and Administrative Consoles.

D. ADMIN7 Administrative Console

1. The console shall clearly distinguish between normal and emergency call-ins.
2. The console shall use a priority-based call-in display queue, where critical call-ins are placed at the top of the call queue.
3. The console shall allow the user to select call-ins out of queue order.
4. The console shall display active critical alert badges such as Lockdown.
5. The console shall facilitate quick access to color-coded emergency tones and alerts, including Lockdown and All Clear.
6. The console shall facilitate two-way intercom calls, phone-to-phone calls, paging to zones, tones to zones, and music distribution to zones.
7. The console shall display its IP address and other system information and connectivity status.
8. The console shall include a minimum display size of 7" with a color touch-screen display.
9. The console shall not require the use of phone codes for the operation of daily or emergency communications.

E. MapAssistIP Calendar

1. The system shall include a browser-based Calendar interface.
2. The calendar shall have unlimited events that may be programmed into any of the unlimited day schedules.
3. The schedules shall be calendar-based and allow for programming years in advance.
4. The calendar shall facilitate on-the-fly day schedule changes in a calendar-based interface.
5. The calendar shall facilitate the use of exclusion dates for holidays and other special circumstances.
6. The calendar interface shall have options for import, export, and schedule editing.
7. Users shall have configurable role-based access to Calendar with all scheduling functions.

F. External Phones

1. External phones shall access the system through an inbound SIP trunk.

G. Call Stations

1. Call Stations shall be CareHawk Model:
 - a. CS55 Rocker Style Call-in Switch
 - b. CS2-C Push button Call-In Switch
 - c. CS2-CE Push button Call-in/Emergency switch
 - d. CS-D30-IP Silicone Button Call-in switch
2. Shall be capable of Normal and Emergency Calls.
3. Normal Calls are initiated by pressing the Call button once.
4. Emergency Calls are initiated by pressing the Emergency Call button once.
5. The system must have Emergency Call escalation.
 - a. If the emergency call is unanswered by the designated extension and the emergency call escalation is programmed, the emergency call shall be forwarded to all the other administrative extensions. Systems that do not provide Emergency call escalation will not be considered equal.
6. The stations shall be able to provide Lockdown Acknowledgement
 - a. This shall be provided through the pressing of any button on the station following the initiation of a Lockdown.
 - b. After acknowledgement, the buttons revert to the default functionality.

H. Alert Stations

1. Alert stations shall be CareHawk Model:
 - a. AS-3B-LWE
2. Alert stations shall be capable of triggering a Lockdown, Weather/Tornado or Evacuate critical tones.
3. Alert stations shall include a minimum of two software-programmable buttons.

I. VCall+

1. The mobile application will initiate normal and emergency call-ins to MapAssistIP and ADMIN7 consoles from the selectable classroom endpoints.
2. Call-ins initiated by the mobile application will be displayed on the MapAssistIP and ADMIN7 consoles as VCall+ triggered (with mobile device callback number if configured).
3. This system shall not provide direct audio communication to the mobile application.
4. The system shall initiate Lockdown and up to 10 custom tones from the mobile application.
5. The mobile application will initiate Lockdown Acknowledgement from the selectable classroom endpoints.
6. The system shall allow for the configuration of users, roles and permissions based on login credentials.
7. The mobile application will indicate any active alerts through a graphical display and vibration.

J. GPIO-8I-8O Integration Hub

1. The system shall include 8 contact closure inputs and 8 relay outputs.
2. The system shall allow for a combined 16 contact closure inputs and 16 relay outputs (2 x GPIO-8I-8).
3. The GPIO-8I-8O Hub shall be powered by POE or an optional external 12V power supply.
4. The GPIO-8I-8O Hub shall support LLMNR addressing.
5. The GPIO-8I-8O Hub shall include runtime communication with AES-128 encryption.
6. The GPIO-8I-8O Hub shall allow for remote browser-based firmware updates.
7. The GPIO-8I-8O Hub shall allow for supervision and firmware fatal error reporting and logging.
8. The GPIO-8I-8O Hub shall allow additional criteria configuration for event processing.

2.04 SYSTEM PARAMETERS

- A. The communication system shall be a CareHawk CH2000IP Life Safety Communication platform and provide an IP-based communication network between administrative areas and indoor and outdoor locations throughout the facility over VLANs.
- B. The system shall provide integrated criteria-based contact closure inputs and relay outputs for communication with third-party systems. Systems that do not contain event-processing communication ports shall not be considered.
- C. The system shall provide no less than the following features and functions:
 1. IP-based SIP communications between GW2WIP1/GW2WIP2 gateways, MapAssistIP, and ADMIN7 consoles. Each gateway shall support a 10-watt speaker output, a normal/emergency call-in station, and external relay support. A single gang plate-mounted microphone shall be installed for two-way audio communication.
 2. Paging only speaker locations shall use a GW2WIP1/GW2WIP2 SIP gateway connected to either a DAF100 or DAF300 25V or 70V amplifier and shall use twisted pair cable. A system that uses shielded wire shall not be acceptable.
 3. System amplifiers shall be Class D only.

4. Classroom and hallway locations needing visual displays shall use CLKMSL10(D)-(SPK) messaging displays. The SPK version shall support a 4" 4-watt speaker and microphone with echo suppression. Use of a remote call switch shall be supported (applicable to -SPK versions only). 10-inch LCDs shall show visual graphics for emergency and non-emergency events. Four integrated RGB multicolor strobe LEDs per display shall be available to enhance any visual alert.
 5. Communal areas (Cafeterias/Gymnasiums) needing visual displays shall use CLKMSL22A messaging displays. The display shall support 15W(@4ohms) or 9W (@8ohms) external speakers with the internal amplifier. This unit shall provide AGC based on ambient audio levels. The unit shall provide a line out for use with external amplifiers and a configurable dry contact closure.
- D. The system shall consist of any combination of the following:
1. Classrooms shall consist of wall or ceiling-mounted 8ohm loudspeakers, a call-in station, a microphone, a GW2WIP1/GW2WIP2 gateway, and optionally a CLKMSL10 messaging display for visual messages, or a CLKMSL10-SPK with integrated speaker and microphone with connected call-in station.
 2. MapAssistIP Administrative Display and ADMIN7 Administrative Console.
- E. The Emergency Page All-Call function shall have the highest system priority that will suspend security alert audio for additional announcements.
1. Systems that do not treat Emergency Page All-Call page with the highest priority shall not be deemed as equal.
- F. There shall be at least 100 user tone slots available for pre-recorded tones/announcements. Any of these can be dedicated Emergency Alarm Tones. Each shall be accessed from the MapAssistIP Administrative Display, ADMIN7 console, or any authorized PBX. Systems using external alarm generators or having less than 100 pre-recorded tones/announcements shall not be acceptable.
- G. The system shall provide for three-, four-, five-, or six-digit architectural room numbers with description.
- H. There shall be an automatic level control for return speech during amplified voice communications.
- I. Each room's loudspeaker shall be assigned to any single, any combination, or all of 64 multi-purpose zones per facility. Systems with less than 64 multi-purpose zones shall not be acceptable.
- J. There shall be unlimited Time-Signaling Schedules with unlimited user-programmed events per facility. Each event shall trigger one of the user-selected tones or program sources. It shall be possible to assign each schedule to a day in an unlimited calendar or to manually change schedules from the MapAssistIP Administrative Display. Systems that do not provide unlimited time-signaling schedules or a choice of 100-time tones and external audio shall not be acceptable.
- K. There shall be a zone-page/all-page feature that is accessible by MapAssistIP Administrative Display, ADMIN7 console, and authorized PBX
1. There shall be a preannounce tone signal at any loudspeaker selected for voice paging.
- L. There shall be a voice-intercom feature that is accessible by MapAssistIP Administrative Display, ADMIN7 console and authorized PBX
1. There shall be a privacy tone every 15 seconds to signal that any loudspeaker selected for amplified-voice intercom is active.

2. There shall be a preannounce tone signal at any loudspeaker selected for voice intercom communication.
3. Privacy and pre-announce tone signals shall be capable of being disabled during system initialization.

M. Each Classroom call station shall support two call-in types, as follows:

1. Normal
2. Emergency
3. Emergency Call-ins from Classroom Call Switch Stations shall jump to the top of the call-in queue and alert the MapAssistIP Administrative Display via a distinctive ring and the map location flashing red. If the MapAssistIP Administrative Display is busy, the user shall be alerted via a tone. Systems which interrupt calls shall not be acceptable.
4. Normal calls shall be logged into a queue for the designated MapAssistIP Administrative Display.
5. Each queue shall first be sorted by call priority (emergency calls, and then normal calls). Calls are sorted within each priority level on a first-in, first-out basis. When a call is answered, it shall automatically be removed from the queue. Systems that do not sort calls according to priority and order received shall not be acceptable.
6. It shall be possible to answer any incoming call simply by clicking the map location while it is ringing. It shall not be necessary to hit any buttons to answer a call unless the call has dropped into the queue.

N. MapAssistIP Administrative Display

1. Incoming calls can be directed to the desired administrative console via call groups.
2. The display shall, by default, show the time of day, day of the week, the current time, and the locations of all stations calling with the call-in status of each station (normal or emergency).
3. When dialing from MapAssistIP, the console shall indicate the room number being dialed.
4. The display shall provide user-friendly menu selections to assist the operator when paging and distributing program material. Systems that require the operator to memorize long lists of operating symbols or control codes shall not be acceptable.
5. Program selection and its distribution or cancellation shall be accomplished from a designated MapAssistIP Administrative Display with the assistance of the menu display system. Distribution and cancellation shall be to any one or combination of speakers, any zone(s), or all zones. It shall be possible to provide multiple program channels at the same time.
6. It shall be possible, via a MapAssistIP Administrative Display, to manually initiate any of 100 tones. The tones shall be separate and distinct.
7. Each MapAssistIP Administrative Display shall maintain a unique queue of all stations calling that phone.

O. System programming shall be from the CH2000IP browser-based interface. All system programming data shall be stored in nonvolatile memory.

1. Diagnostics shall be built into the system and be accessible via a web browser and only by authorized personnel. Diagnostics shall show all activity with a 30-day log of all events. Logs shall be exportable for in-depth system analysis. Systems that do not provide a summary of the activity shall not be deemed equal.
All programming and data access shall be through an Ethernet connection. Systems that do not have a built-in Ethernet port shall not be deemed equal.

P. IP Endpoint Supervision

1. The system shall include supervision of IP endpoints including:
 - (i) GW2WIP1/GW2WIP2 Gateways
 - (ii) CLKMSL Messaging Displays

- (iii) GPIO-8I-8O Integration Hubs
 - (iv) ADMIN7 Administrative Consoles
 - (v) MapAssistIP Administrative Display
2. The system shall attempt automatic active recovery of IP endpoints should a malfunction or error occur.
 3. The system shall include the ability to alert end users via software and/or automated emails if an IP endpoint is offline.

2.05 SPEAKERS

A. Standard constant voltage speakers for paging in hallways, communal areas, and outside paging. Groups of speakers are connected via external amplifiers (DAF100/300 25/70) and fed by the GW2WIP1/GW2WIP2. These speakers do not support intercom/talkback communication through the IP system, only one-way paging.

1. The CH-SYSTEM 5 is a complete, UL Listed, shallow depth, lightweight, 1' x 2' ceiling tile replacement loudspeaker system consisting of an 8" O.D. dual cone loudspeaker with a 5 oz. magnet and a 5W-25/70V transformer. The molded fiber enclosure is 617 CID. Powder-coated steel baffle with standard perforation and four (4) seismic tie-off points. The cable clamp and one (1) 24" "T" rail are included.
 - i. Average Sensitivity - 92 dB SPL, 1W/1M
 - ii. Loudspeaker Power Rating - 12W RMS EIA 426A Standard
 - iii. Maximum Power Rating - 15W @ 8 Ohms
 - iv. Calculated Output - 99 dB-SPL 5W/1M
 - v. Magnet Type & Weight - BeFe Ceramic, 5 oz. Nominal
 - vi. Frequency Response - 65 Hz - 17 kHz EIA 426A Standard
 - vii. Nominal Coverage Angle - 100° Included Angle -6 dB / 2 kHz, Half space.
 - viii. Audio Connection - 4" Color-Coded Leads, (5W, 2.5W, 1.25W, 0.63W, 0.31W)
 - ix. Unit Weight – 3.85 Lbs.
2. The CH-SYSTEM 12 is a complete, UL Listed, shallow depth, lightweight, 2' x 2' ceiling tile replacement loudspeaker system consisting of an 8" O.D. loudspeaker with a 5 oz. magnet and a 5W-25/70V transformer. The molded fiber enclosure is 1,283 CID. Powder-coated steel baffle with standard perforation and four (4) seismic tie-off points. The cable clamp is included.
 - i. Average Sensitivity - 92 dB SPL, 1W/1M
 - ii. Loudspeaker Power Rating - 12W RMS EIA 426A Standard
 - iii. Maximum Power Rating - 15W @ 8 Ohms
 - iv. Calculated Output - 99 dB-SPL 5W/1M
 - v. Magnet Type & Weight - BeFe Ceramic, 5 oz. Nominal
 - vi. Frequency Response - 65 Hz - 17 kHz EIA 426A Standard
 - vii. Nominal Coverage Angle - 100° Included Angle -6 dB / 2 kHz, Half space.
 - viii. Audio Connection - 4" Color-Coded Leads, (5W, 2.5W, 1.25W, 0.63W, 0.31W)
 - ix. Unit Weight - 6.05 Lbs.
3. The CH-QH16T is a compression type, double re-entrant horn loudspeaker with an integrated 16W-25/70V rotary select transformer and an adjustable mounting base. Tan, enamel finish.
 - i. Average Sensitivity - 110 dB SPL, 1W/1M
 - ii. Loudspeaker Power Rating - 16W RMS EIA 426A Standard
 - iii. Calculated Output - 121 dB-SPL 16W/1M
 - iv. Frequency Response - 450 Hz - 15 kHz EIA 426A Standard
 - v. Nominal Coverage Angle - 110° Included Angle -6 dB / 2 kHz, Half space.
 - vi. Audio Connection – Screw Terminals

- vii. Transformer – 25/70V 16W-5 Tap Rotary Select (16W, 8W, 4W, 2W, 1W)
- B. Addressable speakers for classrooms and other areas requiring intercom with talkback. Attached to a GW2WIP1/GW2WIP1 with a GWMIC (microphone) to provide two-way audio. All speaker connectivity must follow OHM'S LAW. Multiple speakers connected to a single gateway may require series/parallel configuration
- 1. The CH-SYSTEM 5/8 is a complete, UL Listed, shallow depth, lightweight, 1' x 2' ceiling tile replacement loudspeaker system consisting of an 8" O.D. loudspeaker with a 5 oz. magnet and an 8 Ohm impedance. The molded fiber enclosure is 617 CID. Powder-coated steel baffle with standard perforation and four (4) seismic tie-off points. The cable clamp and one (1) 24" "T" rail is included. This speaker requires the addition of a GW2WIP1 gateway and a GWMIC microphone if talkback is required.
 - i. Average Sensitivity - 92 dB SPL, 1W/1M
 - ii. Loudspeaker Power Rating - 12W RMS EIA 426A Standard
 - iii. Maximum Power Rating - 15W @ 8 Ohms
 - iv. Calculated Output - 102 dB-SPL 12W/1M
 - v. Magnet Type & Weight - BeFe Ceramic, 5 oz. Nominal
 - vi. Frequency Response - 65 Hz - 17 kHz EIA 426A Standard
 - vii. Nominal Coverage Angle - 100° Included Angle -6 dB / 2 kHz, Half space
 - viii. Audio Connection - 6" Leads
 - ix. Unit Weight – 3.85 Lbs.
- C. The CH-SYSTEM 12/8 is a complete, UL Listed, shallow depth, lightweight, 2' x 2' ceiling tile replacement loudspeaker system consisting of an 8" O.D. loudspeaker with a 5 oz. magnet and an 8 Ohm impedance. The molded fiber enclosure is 1,283 CID. Powder-coated steel baffle with standard perforation and four (4) seismic tie-off points. The cable clamp is included. This speaker requires the addition of a GW2WIP1 gateway and a GWMIC microphone if talkback is required.
- i. Average Sensitivity - 92 dB SPL, 1W/1M
 - ii. Loudspeaker Power Rating - 12W RMS EIA 426A Standard
 - iii. Maximum Power Rating - 15W @ 8 Ohms
 - iv. Calculated Output - 102 dB-SPL 12W/1M
 - v. Magnet Type & Weight - BeFe Ceramic, 5 oz. Nominal
 - vi. Frequency Response - 65 Hz - 17 kHz EIA 426A Standard
 - vii. Nominal Coverage Angle - 100° Included Angle -6 dB / 2 kHz, Half space
 - viii. Audio Connection - 6" Leads
 - ix. Unit Weight - 6.05 Lbs.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine conditions with the installer present for compliance with requirements and other conditions affecting the performance of the Integrated Telecommunications/Time/Audio/Media System.
 - B. Do not proceed until unsatisfactory conditions have been corrected.
- The installation, adjustment, testing, and final connection of all conduits, wiring, boxes, cabinets, etc., shall

3.02 INSTALLATION

- A. Installation shall conform to local electrical requirements and be sized and installed in accordance with the manufacturer's approved shop drawings.

- B. Low-voltage wiring may be run exposed above ceiling areas where easily accessible but must be installed and supported in compliance with current codes and standards.
- C. All Administrative Consoles shall be desk- or counter-mounted.
 - 1. Verify the exact location with the Architect.
- D. System Configuration
 - 1. All configuration parameters need to be gathered from the facility administration for the system configuration.

3.03 GROUNDING

- A. Provide equipment grounding connections for Integrated Telecommunications/Time/Audio/Media System as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to ensure permanent and effective grounds.
- B. Ground equipment, conductor, and cable shields to eliminate shock hazards and to minimize to the greatest extent possible, ground loops, common mode returns, noise pickup, cross talk, and other impairments.
- C. Provide all necessary transient protection on the AC power feed and all audio lines leaving or entering the building.
- D. Note in the drawing the type and locations of these protection devices as well as all wiring information.
- E. Furnish and install a dedicated, isolated earth ground from the central equipment rack and bond to the incoming electrical service ground bus bar.

PART 4 - EXECUTION

4.01 DIVISION OF WORK

- A. While all work included under this specification is the complete responsibility of the contractor, the following division of actual work listed shall occur.
 - 1. The conduit, outlets, terminal cabinets, etc., which form part of the rough-in work shall be furnished and installed completely by the electrical contractor. The balance of the system, including installation of speakers and equipment, making all connections, etc., shall be performed by the manufacturer's authorized representative. The entire responsibility of the system, its operation, function, testing, and complete maintenance for one year after final acceptance of the project by the owner shall also be the responsibility of the manufacturer's authorized representative.

4.02 EQUIPMENT MANUFACTURER'S REPRESENTATIVE

- A. All work described herein to be done by the manufacturer's authorized representative shall be provided by a documented factory-authorized representative of the basic line of equipment to be used.
- B. As further qualification for bidding and participating in the work under this specification, the manufacturer's representative shall hold a valid C-10 Contractor's License issued by the Contractor's State License Board of [your state]. The manufacturer's representative shall have completed at least 10 projects of equal scope, giving satisfactory performance, and shall have been in the business of furnishing and installing sound systems of this type for at least 5 years. The manufacturer's representative shall be capable of being bonded to ensure the owner of performance and satisfactory service during the guarantee period.

- C. The manufacturer's representative shall provide a letter with submittals from the manufacturer of all major equipment stating that the manufacturer's representative is an authorized distributor. This letter shall also state that the manufacturer guarantees service performance for the life of the equipment and that there will always be an authorized distributor assigned to service the area in which the system has been installed.
- D. The contractor shall furnish a letter from the manufacturer of the equipment that certifies that the equipment has been installed according to factory-intended practices, that all the components used in the system are compatible, and that all new portions of the systems are operating satisfactorily. Further, the contractor shall furnish a written guarantee, guaranteeing all parts for five years after the final acceptance of the project by the owner.

4.03 INSTALLATION

- A. Plug disconnect: All major equipment components shall be fully pluggable using multi-pin receptacles and matching plugs to provide ease of maintenance and service.
- B. Protection of cables: Cables within terminal cabinets, equipment racks, etc...
- C. Cable identification: Cable conductors shall be color-coded, and each cable shall be individually identified. Each cable identification shall have a unique number located about 1 1/2" from the cable connections at both ends. Numbers shall be approximately 1/4" in height. These unique numbers shall appear on the As-Built Drawings.
- D. Instructions: Provide complete "in service" instructions of system operation to school personnel.

4.04 DOCUMENTATION

Provide the following directly to the Supervisor of Technology Service:

- A. A printed copy of all field programming for all system components
- B. One copy of all diagnostic software with a copy of field program for each unit
- C. One copy of all service manuals, parts list, and internal wiring diagrams of each system component
- D. One copy of all field wiring runs, location, and end designation of the system

END OF SECTION