

SECTION 28 41 12 - NURSE CALL SYSTEM

PART 1 - GENERAL

1.1 OVERVIEW

- A. Furnish and install all equipment, accessories, and materials in accordance with these specifications and drawings to provide a complete and operating Nurse/Patient Communications System for: Maine Medical Center, Portland, ME.
- B. All bids shall be based on the hospital's current standardized equipment manufacturer mentioned herein. The catalog numbers, model designations and descriptions are the standard of Maine Medical Center, as manufactured by the Rauland Borg Corporation and as distributed by Signet Electronics Systems, Inc. H.C.C. Group. Norwell, MA 1-800-444-9614, Fax (781) 871-4757
- C. Acceptable/ specified nurse call system(s) are as follows:
 1. Rauland Responder System 4000

1.2 SCOPE OF WORK:

- A. Furnish and install a " networked" Nurse / Patient Communications System(s) comprised of nurse consoles, patient stations, dome lights, entertainment cords, call cords, pull cord stations, emergency push button/code 99 stations, etc., and wiring as shown on the drawings
- B. The Nurse/Patient Communications System shall be installed initially in the specified areas and then be expanded in the future to additional areas. Systems provided in the initial area shall have the capacity to expand to provide seem-less service to the entire facility.
- C. All necessary equipment required to meet the intent of these specifications, whether or not enumerated within these specifications, shall be supplied and installed to provide a complete and operating nurse/patient communications network. Individual nurse call cabinets/system controllers shall be networked via a single Cat.5e x-bus cable for enhanced flexibility/functionality.

1.3 REFERENCES

- A. Underwriter's Laboratories Standard 1069 (UL1069)
- B. Canadian Standards Association
- C. National Electrical Code
- D. U.S. Dept. of Labor / Occupational Safety and Health Administration

- E. State Hospital Code / Joint Commission of Hospitals - Nurses Call Requirements

1.4 SYSTEM SUPPLIER QUALIFICATIONS

- A. The System Supplier shall be an established communications and electronics contractor that has had and currently maintains a locally run and operated business for at least five years. The System Supplier shall hold all applicable state and local licenses.
- B. The System Supplier shall be an Authorized Distributor for the product proposed with full manufacturer's warranty privileges.
- C. The System Supplier shall employ technicians who have attended and successfully completed the manufacturer's technical certification classes for the proposed system.
- D. The System Supplier shall show satisfactory evidence, upon request, that he maintains a fully equipped service organization capable of furnishing adequate inspection and service to the system on a 24-hour / 7-day basis. The System Supplier shall maintain at his facility the necessary spare parts in the proper proportion as recommended by the manufacturer to maintain and service the equipment being supplied.

1.5 SUBMITTALS / PRIOR APPROVAL

- A. In the event the specifying authority deems it necessary to reject the submittals of a System Supplier, the specifying authority may ask the System Supplier to re-submit if the discrepancies are minor. Otherwise rejection of submittals means the specified product must be supplied.

1.6 PROJECT SITE VISIT

- A. It is the responsibility of all prospective contractors to make an adequate inspection of the project site.

1.7 SYSTEM DEMONSTRATIONS

- A. It may be necessary to utilize demonstration equipment to test the functional operation of the System Supplier's submitted equipment. System Supplier will be notified of any demonstration dates and times. If such demonstrations are utilized, it will be the sole judgment of the owner and specifying authority to decide whether a contractor/manufacturer meets or exceeds the specification.
- B. All demonstrated equipment must be that of a standard single manufacturer and meet the same required testing and conditions that are applicable to the manufactured equipment. Custom or modified equipment that is not of standard, current manufacture cannot be demonstrated.

- C. If necessary, owner and/or specifying authority may visit manufacturer's facility to view functioning equipment or demonstrations and witness equipment manufacturing techniques and/or testing procedures.

1.8 SAMPLES

- A. The owner/specifying authority reserves the right to request samples of terminal (station) equipment for the purpose of coordinating colors, aesthetics, trimplate sizing, etc. These samples would be supplied at no cost to the owner.

1.9 SCHEDULING

It is the responsibility of the System Supplier to coordinate all work with the other trades for scheduling, rough-in, and finishing all work specified. The owner will not be liable for any additional costs due to missed dates or poor coordination of the supplying contractor with other trades

1.10 WARRANTY

- A. The System Supplier shall provide a warranty on the system which shall include all necessary labor and equipment to maintain the system(s) in full operation for a period of one year from the date of acceptance.
- B. In addition, the equipment (parts) warranty for all core system components including control / switching equipment, power supplies, patient stations, sub-stations, and nurse consoles shall extend to a total of at least five (5) years. Warranty for ancillary devices such as pillow speakers and call cords shall extend to a total of at least two (2) years.
- C. Manufacturer shall provide, free of charge, product firmware/software upgrades throughout the warranty period for any product feature enhancements.

1.11 MAINTENANCE

- A. The owner may choose to have the supplying contractor maintain the system(s). The level of service provided during the maintenance contract period would be the same as the warranty period for routine and emergency service. All labor and equipment costs would be covered under this contract. Supplying contractor must state exact billing amounts, billing periods and all costs associated with this maintenance agreement and list any items that would not be covered under the service/maintenance agreement.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. The hospital standard of equipment specified herein is that of the Rauland Borg Corporation and as distributed by Signet Electronics Systems, HCC Group, Norwell, MA 800-444-9614 , Fax 781 871 4757
- B. The intent is to establish a standard of quality, function and features. It is the responsibility of the bidder to ensure that the proposed product meets or exceeds every standard set forth in these specifications.
- C. 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 System Supplier from strict compliance with the requirements of this specification.

2.2 QUALITY ASSURANCE

- A. The nurse / patient communications system shall be listed by Underwriter's Laboratories under UL Standard 1069 - 6th Edition (or latest edition). Underwriter's Laboratories shall be the only acceptable NRTL for system listing.

2.3 SYSTEM CONDUIT, BACK-BOXES AND WIRING

- A. System wiring and equipment installation shall be in accordance with good engineering practices as established by the EIA and the NEC. Wiring shall meet all state and local electrical codes.
 - 1. Contractor shall terminate all wiring with manufacturer approved connectors. The use of wire nuts is prohibited.
 - 2. System shall employ a structured cable system consisting of standard 4-pair Category 5e cable- to service all corridor lamps, and consoles.
 - 3. All wiring shall test free from all grounds and shorts.
 - 4. Wiring shall be UL listed, NEC and NFPA 70, Article 25 approved.
 - 5. Nurse / Patient Communications System wiring shall not be run in the same conduit with other systems (i.e. Class 1 AC power distribution, fire alarm, entertainment systems, lighting controls, etc.).

2.4 SYSTEM FIRMWARE / SOFTWARE MAINTENANCE

- A. The System Manufacturer shall provide, free of charge, product firmware / software upgrades for a period of five years from date of installation for any product feature enhancements. Installation of system upgrade software shall be by the System Supplier and shall be per the labor warranty specified elsewhere.

1. System firmware / software upgrades shall be downloaded to the system by data connection. Upgrades shall be accomplished system-wide from a single point of connection.
2. Systems requiring local programming of individual network components / sub-systems at multiple physical locations or which do not allow for remote download of component firmware or which require the exchange of components, will not be accepted.

2.5 HEAD-END CONTROL EQUIPMENT

- A. Power Supplies – Provide ample power for control equipment, consoles, patient stations, sub-stations, and corridor lamps. All system power supplies must be UL1069 listed as an integral part of the core system. Power supplies which carry only component listings or are otherwise not part of the core system UL listing are not acceptable.
- B. Battery Back-up – Provide battery back-up with ample reserve power to operate the entire system for a minimum of 10 minutes without operational limitations or loss of system function.
- C. Furnish as needed in each area a nurse/patient communications network hub controller. The system as a whole shall be capable of supporting at least 25 hub controllers. Each hub controller shall provide the following:
 1. Support for at least 10 console clusters consisting of standard LCD consoles or annunciate panels.
 2. Support for at least 150 rooms.
- D. It shall be possible for network hub to act as stand alone controller should loss of network communication occur.
- E. System Audio – The system shall be designed to provide audio meeting the minimum standards detailed by the National Electrical Manufacturers Association standard for nurse call system audio.
 1. The system shall utilize 25 Volt balanced signal distribution between head end equipment and room stations.
 2. Audio transmission between hub controllers shall be digital.

2.6 CALL ROUTING / PROCESSING

- A. Call Routing – The system shall support the routing of patient calls to any console, pager, phone or other annunciating device anywhere in the facility or to any combination of the above regardless of the location of the calling station. Calls may be routed and processed based on location, priority or combination.
 1. The system shall support the ability to swing any individual room or any group of rooms by touching one labeled touch point. Room(s) and consoles may be located anywhere within hospital nurse/patient communications network.

2. The system shall allow a console to capture an individual nursing unit, selected units, or all units in hospital by touching single custom labeled touch point.
- B. Call Priorities – The system shall support a minimum of 200 unique, user-definable call priorities.
1. Each call priority shall be reported via a user-defined mnemonic of up to 14 alphanumeric characters.
 2. Selectable call-in tone type, level, and corridor light behavior for each type of call priority.

2.7 SERVICE REQUIREMENTS

- A. The system shall support service requirement reminders. Staff members may, by pressing a button on the console, initiate a service requirement reminder.
1. Service Requirements shall be indicated on the corridor lamp by a flashing lamp.
 2. Users may review the location of service requirements using an LCD Console and / or an Annunciate Panel.
 3. If a service requirement remains unanswered for a pre-determined period of time, an overtime call shall automatically be initiated.

2.8 STAFF FOLLOW

- A. The system shall support manual or automatic Staff Follow functions. When Staff Follow is enabled, call-tones for a prescribed area will automatically be forwarded to the room station speaker where staff members are located. Staff location may be determined manually by entering the room number into the console or automatically using staff register stations. Pressing the call button on that station shall silence the tones. When a new call is placed, the tones shall automatically be restored.

2.9 ROOM MONITORING

- A. The system shall allow staff members to audibly monitor selected rooms.
1. Manual Monitor – Staff members may listen in to a selected room.
 2. Sequential Monitor – Staff Members may enter a selected group of rooms for monitoring. The system will automatically switch from room to room allowing the staff member to sequentially monitor the rooms.
 - a. During monitoring, the staff member may press a button on the console to stop on the current room to listen longer and then press Resume to restart the sequencing.
 - b. The staff member may adjust the time that the system spends on each room.
 3. During Sequential Monitoring, the number of the room currently being monitored shall appear on the console.

2.10 ROOM PRIVACY

- A. The system shall allow staff members to place a room in Privacy Mode to prevent unauthorized or accidental audible monitoring of the room.
 - 1. Rooms may be entered into or removed from Privacy by staff members using the console.
 - 2. When a room that is in Privacy is dialed from a console or telephone, the staff member may speak into the room but they may not listen to the room.
 - a. Privacy in the room may be temporarily suspended to allow two-way communications by pressing the call-in button in the room. When the conversation is terminated, Privacy shall automatically be restored.
 - b. If a call-in is placed from the room, the call may be answered from the console as normal using two-way communications.
 - 3. The rooms in privacy may be reviewed from the LCD console.
 - a. During the review process, rooms may be removed from Privacy mode.

2.11 AUDIO PAGING

- A. The system shall support audio paging from selected consoles.
 - 1. All Page - Paging announcements may be made from a console to all room stations in the system.
 - 2. Group Page – Announcements may be made to all room stations within a console's coverage area.
 - 3. Staff Page – Announcements may be made to rooms in which staff members are registered.
 - 4. Paging Announcements may be made to overhead speakers via a connection to the facility Public Address System.
 - 5. To facilitate a low noise patient environment, the system will support the ability to block paging from selected consoles.
 - a. Consoles equipped with dial pads may be configured to allow password protection of the paging function to only allow authorized access to audio paging.

2.12 NURSES CONSOLES

- A. System consoles shall be provided as indicated on the plans and drawings. All system consoles shall be UL1069 listed as an integral part of the core system. Telephones, personal computers or other devices which carry only component listings or are otherwise not part of the core system UL listing are not acceptable. Provide Rauland #R4K4020 LCD Master

1. LCD consoles:
 - a. The LCD console shall be a small self-contained unit, which shall not occupy more than 87 square inches of desk space. The console shall include an easy-to-read 4-line / 80-character backlit LCD display.
 - b. The console shall provide function selector buttons and a telephone-style 12-button dial pad. Selector buttons may be used to access user-configured 24-function menu.
 - c. The console may display up to three incoming calls each with an individual elapsed timer indicating how long the call has been pending. Ability to scroll to see additional pending calls.
 - d. While idle, the console shall display the time of day. Time may be displayed in 12 or 24-hour format. Time display shall be consistent system wide.
 - e. Console shall include capabilities for both open voice (speaker / microphone) and telephone style handset. Audio direction (talk / listen) for speaker / microphone and handset may be accomplished via automatic voice switching (VOX) or manually via a Push-to-Talk button.
 - f. The highest priority (or longest pending) call may be answered automatically by lifting the handset or by pressing the Push-to-Talk button. Calls may be answered out of sequence using line selector buttons or by dialing the desired room number.
 - g. Console shall provide independent volume controls for day/night call-in tones. A Mute button shall be provided to temporarily suppress tones for pending calls.
 - h. The console may be desk or wall mounted.
 - i. The console shall employ a modular quick-disconnect connector. It shall be possible to remove and / or replace the console without removing power from the system.
 - j. Programmable LED Annunciator Panel shall be #R4KANN/WM22

2.13 CORRIDOR LAMPS / ROOM CONTROLLERS / ZONE LAMPS

- A. Corridor Lamps (4-L.E.D. style) shall be provided as indicated on the plans and drawings. Provide Rauland CLA244.
 1. Corridor Lamps shall utilize LED's for high visibility, long life and low maintenance. Corridor Lamps utilizing incandescent lamps shall not be acceptable.
 - a. The corridor lamp shall make use of multiple colors and programmable flash rates and patterns to indicate pending calls, service requirements and staff presence.
 2. Corridor Lamps shall serve as the hub for all room wiring. All field wire connections shall be accomplished using modular connectors.
 3. Any Corridor Lamp shall be able to function as a Zone Lamp that shall visually annunciate calls from assigned rooms / stations without the use of a Zone Lamp controller such as a duty station.

4. The Corridor Lamp shall be equipped with a heart-beat LED (visible to service personnel) to indicate that the unit is functioning properly.
5. The Corridor Lamp shall accommodate a paper label to indicate the room number. The manufacturer shall provide, at no cost, laser-printing template software to create custom room labels.

2.14 ROOM STATIONS

- A. Room Stations (single w/ staff assist) shall be provided as indicated on the plans and drawings. Provide Rauland Model R4K14SA.

1. Room Stations shall be equipped with:
 - a. DIN style receptacle(s) for call cord or pillow speaker.
 - b. Stations in areas requiring two-way communication shall be equipped with a speaker microphone with level matching transformer.
 - 1) Minimum speaker size shall be 3.0" / 7.6 cm
 - c. Reset Button to cancel pending calls. Reset button shall be able to cancel calls from other stations in the room if desired.
 - d. Green LED to indicate that audio to the station is active.
 - e. Red LED(s) to indicate call placement from one or both of the call points.
 - f. Built In Red Staff Emergency Button
2. Room Station functions shall include:
 - a. Calls from dual stations shall be annunciated independently.
 - b. Removing a call cord shall place a Cord Out call.
 - 1) Cord Out calls may be cancelled locally using the Cancel Button. No Dummy Plugs shall be required.
 - c. Room Stations shall support an optional module for interface to feature beds (Stryker, Hill-Rom) side rail control including bed exit alarming and entertainment muting.
3. Room Stations shall employ modular connectors. It shall be possible to service Room Stations without removing power from the system.
4. Room Stations shall support inputs from local equipment alarm contacts (e.g. ventilator, IV drip, fire detector, etc.) to notify console of local alarm condition in patient room. There shall be at least four auxiliary call in identifications available.

2.15 STAFF STATIONS

- A. Staff Stations shall be provided as indicated on the plans and drawings. Provide Rauland R4KSS

1. Staff Stations shall be equipped with:

- a. Pushbutton for call placement.
 - b. Reset Button to cancel pending calls. Reset button shall be able to cancel calls from other stations in the room if desired
 - c. Speaker microphone with level matching transformer.
 - 1) Minimum speaker size shall be 3.0" / 7.6 cm
 - d. Green LED to indicate that audio to the station is active.
 - e. Red LED(s) to indicate call placement.
2. Staff Stations shall employ modular connectors. It shall be possible to service Staff Stations without removing power from the system.

2.16 DUTY STATIONS

- A. Duty Stations shall be provided as indicated on the plans and drawings. Duty Stations shall provide remote annunciation of calls from assigned room stations. Provide Rauland R4KDY.
 1. Duty Stations shall be equipped with:
 - a. Pushbutton for call placement.
 - b. Reset Button to cancel pending calls. Reset button shall be able to cancel calls from other stations in the room if desired
 - c. Speaker microphone with level matching transformer.
 - 1) Minimum speaker size shall be 3.0" / 7.6 cm
 - d. Green LED to indicate that audio to the station is active.
 - e. LED's to mimic corridor lamps of assigned room stations.
 2. Duty Station functions shall include:
 - a. Remote annunciation of calls from assigned bedside stations and sub-stations via 4 LED's call tones. Call tones generated at duty station must be in synch with tones produced at closest nurse console.
 3. Duty Stations shall employ modular connectors. It shall be possible to service Duty Stations without removing power from the system.

2.17 SUB-STATIONS

- A. Provide Sub-stations as indicated on the plans and drawings. Sub-station types shall include:
 1. Pull Cord Stations - Pull cord sub-stations shall be water resistant with a PVC (poly-vinyl chloride) pull-cord, membrane reset button and covered call assurance LED. Unit may utilize remote cancel button for ease of nurse cancel

- when pull cord station is mounted in inaccessible location (e.g. ceiling).
Provide Rauland R4KPC10
2. Single Call Pushbutton Stations - Single Call Pushbutton stations shall be equipped with call button, reset button and call assurance LED. Rauland #R4KPB11.
 - a. Call Button shall be red in color and shall be large (minimum 2.0" / 5.0cm) for easy use.
 - b. Call Button shall be backlit for easy location / identification in reduced light settings and shall be labeled to clearly define its function. Station shall be marked for "staff assist".
 - c. Reset button shall be able to cancel calls from other stations in the room if desired
 - d. Provide clear plastic shroud with lift up cover (stopper cover) over station to prevent accidental station activation.
 3. Dual Call Pushbutton Stations - Dual Call Pushbutton stations shall be equipped with two color coded call buttons, reset button and call assurance LED's. Provide Rauland #R4KPB22 /R4KCSC Clear Cover
 - a. Call Button shall be labeled to clearly define its function.
 - b. Call Buttons shall annunciate independently of one another.
 - c. Call Buttons shall be backlit for easy location / identification in reduced light settings and shall be labeled to clearly define its function.
 - d. Reset button shall be able to cancel calls from other stations in the room if desired
 - e. Shall be color coded and marked as Code 99 and Staff Assist and be provided at the typical patient headwalls.
 - f. Provide clear plastic shroud with lift up cover over station.
 4. Four Button Room Status Station- Rauland #R4KPB44 shall be equipped with (4) colored status touchpoints, and status assurance LED's. When activated, each button shall light a corridor light, and LED Annunciator status panel to indicate the room or patient status. Provide as shown on contract drawings.

2.18 PATIENT ENTERTAINMENT SPEAKER/CALL CORDS

- A. Patient Entertainment Speakers / Call Cords shall be provided as indicated on the plans and drawings. All Patient Entertainment Speakers / Call Cords shall be UL1069 listed as an integral part of the core system. Devices which carry only component listings or are otherwise not part of the core system UL listing are not acceptable.
 1. Standard Call Cords – Standard Call Cords shall be pendant type with a single easy to activate call button, DIN style male plug and sheet clip. Cable shall be a minimum of 10' / 300cm. One (1) standard call cord shall be provided for each bed with an additional 10% provided as spares.
 2. Digital Patient Entertainment Speakers – Patient Entertainment Speakers shall be provided for patient call-in and entertainment system control / audio. Provide for every associated hospital grade wall television as shown on plans.

3. All control buttons including call button shall be raised and textured membrane style. Buttons shall be labeled graphically for easy identification of functions. Control buttons shall be Braille embossed.
4. Control buttons shall include:
 - a. Single easy to activate call button
 - b. Television / Radio controls as required.
5. The TV control mechanism shall be analog or digital as required by the facility televisions.
6. Cord shall be 10' / 300cm and shall be modular for replacement by maintenance personnel. A sheet clip shall be attached to the cord.
7. Speaker (minimum size 2.25" / 5.7cm) shall be liquid resistant. Thumb-wheel volume control shall be provided.
8. Call Assurance LED shall be integral to the unit.
9. Cord Saver - All Patient Entertainment Speakers shall be provided with a 15" / 38cm DIN style Cord Saver.
10. Patient Entertainment Speaker Hanger - All Patient Entertainment Speakers shall be provided with a wall hanging bracket.

2.19 SYSTEM DIAGNOSTICS

- A. The system shall provide continuous self-diagnostics. The system shall also support advanced computer diagnostics by local or remote technical personnel.
 1. All components in the system shall be continuously supervised for both power and signal to ensure proper operation and in the case of system faults to aid in troubleshooting.
 2. The system shall the ability to diagnose all network active components, controllers, control stations, and sub-station operation from any designated network data interface location, on or off site. Network administrator shall be able to:
 - a. Review system faults reported (i.e. station failure)
 3. The system shall provide the ability to automatically notify maintenance personnel via pocket page in the event of a system trouble or failure.

PART 3 - EXECUTION

3.1 SUPERVISION

- A. System shall be installed, maintained and serviced by or under the supervision of manufacturer certified technicians

3.2 IN-SERVICE TRAINING

- A. The System Supplier shall provide thorough training of all nursing staff assigned to those nursing units receiving new nurse/patient communications equipment. This training shall be developed and implemented to address two different types of staff. Floor nurses/staff shall receive training from their perspective, and likewise, unit secretaries (or any person whose specific responsibilities include answering patient calls and dispatching staff) shall receive operational training from their perspective. A separate training room will be set up that allows this type of individualized training utilizing in-service training unit, prior to cut over of the new system.

3.3 ELECTRICAL POWER CONNECTIONS

- A. It shall be the responsibility of the facility to provide a dedicated 120 VAC, 60 HZ conduit feed into the equipment cabinet. This power feed shall not have any other devices connected directly to it. A 20 AMP circuit breaker located in the electrical sub-panel labeled "nurse call" will control this circuit. This electrical circuit will be connected to the facility's emergency power system for automatic power switch over during loss of utility power.
- B. Connect all network system power supplies and equipment cabinets to a common earth ground utilizing a 14 AWG, or larger, solid conductor which is at minimum the same conductor size as the AC feed wires.

3.4 PROTECTION OF NETWORK DEVICES

- A. Contractor shall protect network devices during unpacking and installation by wearing manufacturer approved ESD wrist straps tied to chassis ground. The wrist strap shall meet OSHA requirements for prevention of electrical shock, should technician come in contact with high voltage.

3.5 DRAWINGS

- A. Provide as built drawings of all installed network components and associated wiring on building back-round plans on AUTOCAD cd rom or printed color media. Final payment for work will not be authorized unless these drawings are supplied.

END OF SECTION