

SECTION 16725

NURSE CALL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes audiovisual equipment using true duplex audio and fully computerized control. All master stations in an area are connected to a central exchange. Master stations shall be capable of communicating selectively with each other and with connected patient and other stations.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Detail the system including the following:
 - 1. Cabling Diagrams: Single-line block diagrams showing cabling interconnection of all components for this specific equipment. Include cable type for each interconnection.
 - 2. Wiring Diagrams: Power, signal, and control wiring.
 - 3. Station Installation Details: For built-in equipment; dimensioned and to scale.
 - 4. Equipment Cabinet Drawings: Dimensioned and to scale.
- C. Coordination Drawings: Detail system components that fit, match, and line up with provisions made in equipment specified in other Sections or in separate contracts:
 - 1. Patient head-wall units.
 - 2. Patient consoles.
 - 3. Patient beds with built-in nurse call features. (Stryker or Hill- Rom)
- D. Manufacturer Certificates: Signed by manufacturers certifying that nurse call equipment complies with requirements and that all components are UL1069 listed.
- E. Field Tests Reports and Observations: Include record of final adjustments certified by Installer.
- F. Operation and Maintenance Data: For nurse call equipment to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 include the following:
 - 1. Operating instructions.
 - 2. Troubleshooting guide.
 - 3. Wiring diagrams and terminal identification.
 - 4. Equipment parts list.
 - 5. Product data for types and sizes of wires and cables used.
- G. Warranty: Special warranty specified in this Section.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is factory trained and factory certified for installation of units required for this Project. Include copy of installers' factory certification certificate.
- B. Manufacturer Qualifications: A firm experienced in manufacturing equipment similar to that indicated for this Project and that maintains technical support services capable of providing user with free factory training and training manuals. Factory must maintain access to parts, and emergency maintenance and repair on a 24/7/365 basis with a 24-hour-maximum response time. Factory must maintain, at no cost to the end user, a 24 hour telephone support network.
- C. Source Limitations: Obtain nurse call equipment components through one source from a single manufacturer who has been in the nurse call manufacturing business no less than 20 years and has never been purchased or sold during that time. Manufacture shall not have been purchased or sold within the past 5 years.
- D. Electrical Components, Devices, and Accessories: Listed and labeled according to UL 1069 as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.5 COORDINATION

- A. Coordinate patient control units with items controlled that are not part of nurse call equipment.
 - 1. TV: Channel selection and volume.
 - 2. Lights: Reading light at patient location.
 - 3. TV: Audio suspension when patient calls are placed on system.
- B. Coordinate wiring paths and maintenance access at locations listed below. Coordinate trim features and finishes at these locations to present a unified design appearance.
 - 1. Patient head-wall units.
 - 2. Patient consoles.
 - 3. Patient beds with built-in nurse call features.
 - 4. Nurse station.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Contract documents indicate the scope of work of the contract, and related requirements and conditions that have an impact on the project. Related requirements and conditions that are indicated on the contract documents include, but are not necessarily limited to, the following:
 - 1. Existing site conditions and restrictions.
 - 2. Other work prior to work of contract.
 - 3. Alterations and coordination with existing work.
 - 4. Other work to be performed concurrently by Owner.
 - 5. Other work to be performed concurrently by separate Contractors.
 - 6. Other work subsequent to work of Contract.
 - 7. Requirements for occupancy by Owner prior to completion of work of contract.

2.2 Summary

- A. This performance specification provides the minimum requirements for an audio-visual nurse call system with true duplex audio. The System shall include, but not be limited to all equipment, materials, labor, documentation, and services necessary to furnish and install a complete, operational nurse call system with true duplex audio between nurse call master station and patient stations. The System shall have full duplex audio. The system shall be manufactured in the USA and all plastic faceplates shall have "made in USA" stamped on each piece. The System shall comply in all respects with all pertinent codes, rules, regulations, and laws of the hospital authority and local jurisdiction. The System shall comply in all respects with the requirements of the specifications, Manufacturer's recommendations and the system shall be 100% listed under Underwriters Laboratories Inc. (UL) Listings.

Each System shall be capable of supporting in excess of 500 Patient Stations and 5,000 Peripheral Stations. The System shall support networking of no less than three systems of this size to a single integrated platform for:

System shall run on one cable that includes CAT5e, 18AWG 2C with special shielding and color coded jacket for easy identification of nurse call cable in cable trays, etc. Cable must have nurse call manufacturer name stamped on jacket.

1. Wireless communications system(s)
2. Reporting Database
3. ADT Integration
4. Wireless Locating
5. Electronic Whiteboard
6. PC Staff Console applications
7. Patient/Staff Assignments
8. Automatic/Manual Messaging
9. Remote diagnostics
10. Room Status System
11. Direct patient request of Bed Pan, Pain Medication, and general assistance from the bedside pillow speaker.

It is further intended that upon completion of this work, the Owner be provided with complete information and drawings describing and depicting the entire System(s) as installed, including all information necessary for maintaining, troubleshooting, and/or expanding the System(s) at a future date, and complete documentation of System(s) testing.

Owner shall also be offered the opportunity to attend, free of charge, factory training and certification classes at the factory for unlimited number of facility employees. Travel and accommodations to be paid for by the owner.

2.3 MANUFACTURER

- A. Only known Acceptable Nurse Call System Manufacturer:
1. West-Com Nurse Call Systems, Fairfield, California.
707-428-5900 www.westcall.com
- B. All equipment and components shall be the Manufacturer's current model. All materials, appliances, equipment, and devices shall be tested and listed by the same nationally recognized approval agency for use as part of the Nurse Call System. The Manufacturer's representative shall be responsible for the satisfactory installation of the complete System. The system shall not be older than 6 years and manufacturer must guarantee that the system

will be upgradeable to any new systems the manufacturer may develop. Manufacturer must guarantee "free of charge" any system software upgrades.

- C. The Contractor shall provide, from the acceptable Manufacturer's current product lines, equipment and components, which comply, with the requirements of these specifications. Equipment or components, which do not provide the performance and features required by these specifications, are not acceptable, regardless of manufacturer.
- D. The Manufacturer of the System equipment shall be exclusively involved in the design, manufacture, and distribution of healthcare products specified in this document. The Manufacturer shall have the financial stability to provide project financing/lease options to the Owner if desired; however, under no circumstances shall "bundling" with other non-nurse call products of the same manufacture be allowed.
- E. All System components shall be the cataloged products of a single Supplier. All products shall be listed by the Manufacturer for their intended purpose. West-Com Nurse Call Systems Inc. products constitute the minimum type and quality of equipment to be installed.
- F. All connected field electronics shall be both designed and manufactured by the same company who shall have been in the nurse call business a minimum of 20 years and never been sold or purchased, and shall be tested to ensure that a fully functioning System is designed and installed. The true duplex audio Nurse Call System shall utilize Ethernet topology, switches, gateways, and devices. These devices shall make up a UL 1069 Listed nurse call LAN/WAN.

2.4 REFERENCES

- A. All work and materials shall conform to all applicable Federal, State, and local codes and regulations governing the installation. If there is a conflict between the referenced standards, federal, state, or local codes, and this specification, it is the Bidder's responsibility to immediately bring the conflict to the attention of the Engineer for resolution. National standards shall prevail unless local codes are more stringent. The Bidder shall not attempt to resolve conflicts directly with the local authorities unless specifically authorized by the Engineer.

2.5 DEFINITIONS

- 1. ADT: Admission Discharge Transfer System.
- 2. AFF: Above Finished Floor.
- 3. AHJ: Authority Having Jurisdiction.
- 4. Approved: Unless otherwise stated, materials, equipment, or submittals approved by the Authority or AHJ.
- 5. Circuit: Wire path from a group of devices or appliances to a control module.
- 6. DL: Dome Light.
- 7. MDL: i-Dome
- 8. ESM: Event Subscription Manager.
- 9. HL7: Health Level 7 protocol.
- 10. IP: Internet Protocol.
- 11. IPN: IP Network.
- 12. PD: Peripheral Device.
- 13. PN: Peripheral Network.
- 14. PSpkr: Pillow Speaker.
- 15. SC: Staff Console (Master Station).
- 16. UL or ULI: Underwriters Laboratories, Inc.
- 17. UL Listed: Materials or equipment Listed and included in the most recent edition of

the UL Equipment Directory.

2.6 SYSTEM DESCRIPTION

- A. The System shall be network-based and incorporate decentralized, distributed intelligence architecture. This intelligent architecture shall be built on an IP (Internet Protocol) network. The System shall allow data to be distributed over a common network infrastructure, which is consistent with the communication industry. Communication devices on the network will utilize standards-based or open protocols. The System shall also provide a means of interoperability with 3rd party wired and wireless network devices within the facility, including PCs, PDA's, phones, databases, pagers, Vocera, Etc.
- B. Each System shall be capable of supporting in excess of 500 Patient Stations and 5,000 Peripheral Stations. The System shall support networking of at least three Systems of this size.

The System shall consist of (include):

1. Staff Consoles and Annunciator Panels with color touch screen LCD panels
2. Station Gateways
3. Ethernet Switches/powered distribution hubs
4. Single and Dual Patient Stations
5. Configurable Single-Gang Push/Pull Type Peripheral Devices
6. Single-Gang Dual Aux Input Stations with optional electrical isolation
7. 1, 2, and 4-Section LED Corridor Lights
8. Bed Interface Device
9. Network Bridge and Configuration Software
10. Telephone Gateway
11. Mini-dome on one gang plate for fall risk precaution identification.
12. Room Status one gang devices.
13. Pain Med reminder button

The System shall be capable of integrating to:

1. Any brand of in-building wireless telephone or Vocera system.
 2. Any brand of pocket paging system, ESPA 444 or Tap Protocol.
 3. Hospital data gathering and reporting software.
 4. Staff locating systems (Versus or Visonic), wireless call cords, CCTV switching controls, and door access controls.
 5. Patient-to-staff assignments, wandering patient alarm systems, bed exit and/or fall prevention alarm systems, and patient equipment calls.
 6. Marquee display panels, PC monitors, and large screen monitors such as Flat Panel LCD or Plasma displays
- C. The System shall be capable of Hill-Rom and/or Stryker bed side-rail communication compatibility including visual and audible annunciation of a disconnected bed. Bed interface connections must be "hard wired" and no wireless interface devices will be accepted.
 - D. It shall be possible to configure the System without the use of a modular, flexible GUI or external computer. The administrator must have the ability to manage, (add, delete, modify) and diagnose information within the nurse call network directly from the nurse call system itself.
 - E. The System shall not rely on any laptop or computer for programming of the system. System must be PC based.

- F. The system architecture shall not require external power supplies. Systems requiring power supplies to be installed separately from the control equipment shall not be accepted.

2.7 STATIONS

- A. Patient Stations are a primary point of two-way communication between patients and staff. Equipped with three or more call buttons and a cancel button, they offer users an easy-to-operate means of placing calls on the patient-staff communications system. With a built-in speaker and microphone, these devices also provide patients with the means of opening a full-duplex channel of audio communications with attending staff, and vice versa. On-board LEDs provide operational feedback as well as status indication. System must offer a "Direct Request"© feature allowing the patient to request both "pain med" and "bed pan" assistance directly from the pillow speaker through the patient station directly to the appropriate, assigned, level of staff care provider. Station must be sufficiently lighted so that staff can visualize call buttons in a darkened room.
- B. Smart Patient and Staff/Duty Stations provide separate 10-pin receptacles for the connection of pillow speakers. Each station also provides an optional, isolated, ¼" (0.64 mm) receptacle that can be programmed to accept either an input from auxiliary equipment, or a bed call cord.
- C. Patient Stations shall provide an optional, durable 12-pin pillow speaker strain relief and one user-configurable ¼" jacks for use with patient service devices or as non-latching device monitoring (auxiliary) inputs.
- D. Stations shall provide a minimum of four, color coded, buttons (call, cancel, emergency, code blue) that are non-field configurable allowing Owner to standardize form, function and call priorities throughout the facility.
- E. Patient Stations shall be available with a standard 37-pin bed interface receptacle on the circuit board of the station, for ease of interfacing with bed interfaces when shown on plans, eliminating the need for separate devices or addition of future devices.
- F. Systems unable to provide Patient Stations that support pillow speaker(s), bed interface(s), and up to two auxiliary inputs from the Patient Station shall not be accepted.
- G. Removal of the pillow speaker, bed interface or call cord/auxiliary alarm cable shall generate a "cord out" call.
- H. Stations shall NOT require the use of "dummy" plugs for any receptacles including call cord/auxiliary device, pillow speaker, and bed interface connections. Systems requiring a dummy plug to be inserted to cancel cord out calls shall not be accepted.
- I. At no time shall a Patient Stations provide the ability to intentionally remove a device (call cord, pillow speaker, bed interface) without placing a call to the System. Systems that allow the removal of such devices without placing some type of call shall not be accepted.
- J. At no time shall a station be disarmed allowing for tampering of the system without placing a call directly to the nurse call master station. Systems that allow disarming for cleaning or other purposes shall not be accepted.
- K. It shall not be possible to cancel a call from any cancel button within a patient room except at the station where the precise call was placed. Systems that allow multiple site cancellations

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Novus ® Nurse Call System running on FocusCare® platform

of patient calls shall not be accepted.

- L. All Patient Stations buttons shall be clearly labeled at the factory. Systems that do not have each button clearly labeled by the manufacturer shall not be acceptable.
- M. Patient Stations shall have separate Mylar speaker and microphone to support full duplex audio. Systems using half-duplex audio (voice operated switch) shall not be accepted.
- N. Patient Stations shall include one optional independent auxiliary input (1/4" jacks) capable of supporting either latching medical equipment and/or non-latching call cords. Staff members shall be able to configure these inputs for latching or non-latching inputs at the station without removing the station from the wall. The Patient Stations shall provide a visual indication of the auxiliary input status being set. It shall be possible to add an additional one gang station with three additional (¼" Jacks) for the same purpose. All auxiliary inputs shall be optically isolated.
- O. Patient Stations shall have a status LED to indicate call and communication status.
- P. Each Patient Station button shall have dedicated LED's to indicate that a button has been pressed or is actively indicating a call. Patient Stations using a single LED to indicate the pressing of any button will not be accepted.
- Q. Patient Stations shall support a staff follow mode that, when activated, alerts staff to calls from other stations by an audible tone at and clear text message on their phone or radio pager. The text message must indicate the source of the patient call. Stations that emit an audible tone at other patient stations, thus disturbing other patients and disrupting television service, will not be accepted
- R. Patient Stations shall NOT have DIP switches that require manual setting by field personnel. Each Patient Station shall NOT be preconfigured in a manner that specifies the station type. Stations utilizing manual DIP switches or preconfigured functions shall not be considered. Station Identification and configuration shall be set in the software by any computer on the Nurse Call network. The use of required outside computers to set such functions shall not be acceptable.
- S. Patient Stations shall be hot swappable and not require system shutdown or removal of power prior to replacement.
- T. Patient Stations shall support simultaneous input of pillow speaker and bed. If either connection is removed, audio must automatically transfer to the remaining device or to the on-board station speaker and a "Cord Out" call shall be placed to the appropriate pre-assigned staff member.
- U. Volume level adjustments for each Patient Station shall NOT be acceptable. Volume adjustments must be done on a floor basis and volume adjustments are allowed from the master station handset.
- V. All Patient Stations shall be supervised.
- W. Each Patient Station shall connect to the System wiring via an RJ-45 and power connector. All connections to television and light controllers shall be via removable lever connectors providing simple, hot swappable serviceability.
- X. Patient Stations shall provide a means to provide visibility of buttons in dark rooms.

2.8 STAFF, DUTY STATIONS

- A. Staff/Duty Station features shall be identical in operation to the Patient Station with the exception of the call cord, pillow speaker, and bed interface receptacles.
- B. Annunciation tones at Staff/Duty Stations must be identical to the tones generated by the Staff Console for each priority to clearly identify call types. Systems having duty tones that are not identical to tones generated by the Staff Console shall not be accepted. System must have the ability to assign any wave file to any type of call to generate specific and identifiable call tones.

2.9 PERIPHERAL STATIONS

- A. Peripheral Stations are addressable initiating devices that provide patient room call-for-assistance indication to the patient-staff communications system. When a Peripheral Station is activated, visual indication of the call displays at the dome light associated with the patient room, and an appropriate call indication registers on the staff console, as well as on any installed annunciators.
- B. Each room shall be capable of supporting more than 16 levels of call. These calls shall be configurable to generate any level of call supported by the system configuration. Examples of Peripheral Stations are: Lavatory, Shower, Staff Emergency, Remote Cancel, Pain Med Remind, Housekeeping, Code Blue, Code White, Code Pink, Urgent, Family Call, Staff Normal, Manual Presence, Auxiliary Inputs, etc.
- C. Pushbutton/Pull Cord Stations shall be field configurable to allow one pushbutton for assistance along with a pull cord for emergency calls all to be located on a one gang station for use in patient bathrooms. Assistance calls shall be capable of being assigned to one level of staff while the emergency pull call may be assigned to any number of patient care staff.
- D. Call type/priority for each pushbutton or pull cord shall be programmable in system programming to annunciate the Owner-determined call type. The physical device button label shall be permanent and labeled at the factory by the manufacturer.
- E. Peripheral Stations shall provide on-board lighting for visibility in dark rooms.
- F. Peripheral Stations shall require no more than four wires for installation.
- G. Peripheral Stations shall support the reuse of existing wiring where possible.
- H. Each Peripheral Station button shall have a dedicated LED to indicate that the button has been pressed or is actively indicating a call.
- I. All Peripheral Stations shall have the ability to be individually numbered to represent a separate and distinct location, even stations that are in the same daisy chain.
- J. Peripheral Stations shall not require more than two or less than two screws to be removed for maintenance personnel to remove the station.
- K. Peripheral Stations shall NOT have DIP switches or have a preconfigured identification number that require manual setting by field personnel. Peripheral stations shall be assigned a type at the master station and shall be identified by their factory applied permanent identification name and label.

- L. Peripheral Stations shall be hot swappable and not require system shutdown or removal of power prior to replacement.
- M. Peripheral Station pull cords shall be made of a non-contaminant material to reduce the spread of nosocomial infections. Pull cords made of cotton or other absorbent materials will not be accepted.
- N. Peripheral Stations shall not provide a cleaning mode or any type of mode to allow the station to be turned off for any reason. Stations that allow for deactivation to allow housekeeping to clean station surfaces shall not be allowed.
- O. All Peripheral Stations must be fully supervised.

2.10 MINI-DOME FALL PREVENTION IDENTIFICATION LIGHT

- A. System shall provide a single-gang device placed outside the patient room for indicating patient is a fall risk. Station shall include a translucent dome material that reflects a variety of colors indicating the patient status at that time.
- B. Setting of fall-risk status must be available through the Master station, or a web interface.

2.11 CONSOLES, ANNUNCIATORS AND LIGHTS

- A. Corridor (dome) and zone lights provide bright, easy-to-see visual annunciation that speeds response time and increases caregiver efficiency. These devices are typically installed in corridors and outside patient rooms to provide staff with a visual cue as to the origin of a call placed on the system.
- B. Corridor (dome) lights operate in a similar fashion to annunciator panels or staff consoles: the light color and flash rate indicates the type and priority of the call. Models are available with one, two, three or four sections.
- C. Each Corridor Light shall utilize Light Emitting Diodes (LED) for displaying colors. Corridor Lights utilizing only incandescent bulbs shall not be accepted.
- D. Corridor and Zone Lights shall be available in one, two, three or four sections.
- E. To maintain aesthetics, reduce obstruction, and limit risk of damage to devices, the maximum size of each Corridor Light shall not be greater than 5 inches in length, nor shall it protrude more than 3.5" from the mounted surface.
- F. Each of the four LED Corridor Light sections shall be capable of indicating in excess of six Owner-selected configurable colors. Corridor Lights requiring more than four sections to provide this many colors shall not be acceptable. Code blue shall cause all lights to flash in a rotation manner. Systems that do not allow for special "all light" operation during a Code Blue are not accepted. It shall be possible to cancel the call tones at the master station while leaving the corridor lights flashing to indicate the location of the code call. Code calls must be cancelled at the site of origin.
- G. To allow for maximum flexibility, the Corridor Light shall be configurable via programming to allow multiple sections of a single light to illuminate and/or flash the same color for higher priority calls.
- H. System shall be flexible enough to allow the facility to choose between LED and

incandescent dome lights. Any system that does not offer an option for the style of corridor lights shall not be accepted.

- I. Corridor Light shall provide a diagnostic indication of room status to prevent maintenance personnel from disrupting patients.

2.12 STAFF CONSOLES / NURSE CALL MASTER

- A. The Staff Console shall provide visual identification of the calling station(s) by room number, bed identification, priority, station type or call type. Staff Console audible annunciation shall indicate priority level. Incoming calls shall be displayed on the color display in the colors for their associated priority levels.
- B. The Staff Console shall be IP-based.
- C. The Staff Console shall have a 15" backlit color acoustic wave touch LCD screen. Resistive and capacitive touch panels are not acceptable.
- D. The touch screen shall utilize programmable soft keys as opposed to a mechanical dial/touchpad.
- E. Staff Console display shall provide an adjustable tilt mechanism for viewing clarity.
- F. Intercom audio between the Staff Console and any station in the System shall be full duplex. Systems utilizing one-way (half-duplex) audio shall not be accepted.
- G. The Staff Console shall connect to the nurse call LAN/WAN utilizing CAT5/5e/6.
- H. The call pending screen on the Staff Console shall allow at least nine calls to be visible at a time and provide an indication when more than nine pending calls are present.
- I. The Staff Console shall have the ability to "automatically select" incoming calls in order of priority, or to allow the user to select what call to answer from the pending calls list.
- J. The user shall have the ability to adjust the volume of the Staff Console incoming call tones.
- K. The Staff Console shall be able to call other Staff Consoles on the same network. Staff Console to Staff Console audio shall be full duplex.
- L. Staff Consoles shall have the ability to adjust talk and listen volume levels via easy-to-use controls.
- M. Console shall run on an industrial, fanless PC using 2GB flash-based memory device for operating system and program storage. The computer must run on no less than an Intel Pentium-M processor running at 1.4 GHZ with 512MB RAM. The Computer shall come with Windows XP embedded, and all nurse call applications installed on the flash memory. All data and log files shall be stored on a hard drive. If, by any chance, the hard drive should go down, all data files shall be automatically restored to the flash memory by means of a Data Manager. PC must be custom designed for operation with life safety systems and come with an optional 5 year warranty.

2.13 NETWORK EQUIPMENT

- A. All control equipment shall be IP-based, utilizing IP Switches and gateways between control equipment. These devices shall make up a UL 1069 Listed Nurse Call LAN/WAN. The controller equipment shall be wall mounted.
- B. IP Switches shall be networked, allowing all units/floors of a facility to connect as a single System. Each nurse call system shall connect to the hospital's network via a software bridge that isolates the hospital network from the nurse call network to maintain UL requirements. This connection to provide connectivity to supplemental features such as display screens, an ADT system, wireless telephones, pocket pagers, wireless Voice over IP devices, and a reporting database.

2.14 CALL CORDS

- A. Provide call cords as required. The call cord shall have a heavy duty, molded, ¼" connector, a flexible PVC jacketed cable, and a molded, flame retardant, ABS switch housing. The switch shall be the momentary contact type. The cord shall be <6'> in length, have an integrated sheet clip, and be suitable for ethylene oxide sterilization.

2.15 PILLOW SPEAKERS

- A. Provide one (1) pillow speaker for each Single Patient Station and two (2) pillow speakers for each Dual Patient Station. The pillow speakers shall have an optional 12-pin, durable plug that is designed to function as a strain relief and that can withstand accidental removal from station plug without damage to pillow speaker or patient station. The housing shall contain the nurse call button, a speaker, and buttons for TV volume control and channel control in a molded, ABS housing. The features must include Direct Request ® (Pain Med and Bed Pan) features, and be flame-retardant. The cord shall be 8' in length and have an integrated sheet clip. Pillow Speakers must UL 1069 approved with the system. Pillow Speakers not UL1069 approved as part of the nurse call system shall not be acceptable.

PART 3 - EXECUTION

3.1 INSTALLATION

Patient Room Area

- Patient call station(s) with nurse assist, code blue and cancel.
- Emergency pull cord with push for assist button in toilet. (A one gang station with One button for assist and pull cord for Emergency)
- Weatherproof emergency pull cord in shower.
- 4 color dome light (Coordinate colors with owner).
- Nurse staff/duty station with call button.
- Nurse masters (staff consoles) where shown.
- Nurse zone lights to identify corridor with call.
- Mini-Dome light to indicate patient fall risk.
- Receptacle in patient station for connection to Stryker bed.
- Pillow speaker with TV control, light control, and nurse call.
- TV control between nurse call and television with TV audio suspension that turns television audio off when patient call is in progress.

Emergency Department

- Single patient call station with nurse assist, code blue, TV control and cancel.
- Emergency assist station w/ pull cord and push “assistance” button in toilet.
- 4 color dome light.
- Nurse/Staff/duty station with call button.
- Nurse master for area. Code blue shall annunciate immediately at PBX and E.D. master station and Patient Room Master Station. All other calls shall first annunciate at E.D. Master. When interfaced with a paging or telephone system, all Code Blue calls shall go directly to code team wireless devices.
- Pillow speaker with TV control and nurse call.
- TV control between nurse call and television.

OR Area

- Single patient call station with nurse assist, code blue, and cancel.
- Emergency pull cord in toilet.
- 4 color dome light
- Nurse/Staff/duty station with call button.
- Nurse Master for area. Code blue shall annunciate immediately at PBX and O.R. Master Station. All other calls shall first annunciate at O.R. Master and if not responded to in 30 seconds also annunciate at Nearest Nurse Call Master. When interfaced with a paging or telephone system, all Code Blue calls shall go directly to code team wireless devices.
- Push button assist with emergency call cord.
- Optional Intercom station with LCD screen and full key pad.

Radiology Area

- Staff/Duty station with call button code blue and assist button where shown.
- 2 color dome light.
- One gang Assist button with Emergency pull in toilet.
- Nurse Master for area. Code blue shall annunciate immediately at PBX and Radiology Master Station. All other calls shall first annunciate at Radiology master and if not responded to in 30 seconds also annunciate at nearest backup Nurse Call Master. When interfaced with a paging or telephone system, all Code Blue calls shall go directly to code team wireless devices.

Switchboard

- Install 42” LG plasma annunciator at switchboard to annunciate all code blue calls for hospital.

Blood Draw

- Install one gang assist button with emergency pull cord in toilet with annunciation at local staff/duty station and Nurse Call Master Station.

Physical Therapy

- One Gang Assist button w/ Emergency pull cord in toilets.
 - Nurse assist buttons.
 - 1 color dome light.
- B. Wiring Method: Install wiring in raceway except within consoles, desks, and counters; and except in accessible ceiling spaces and in gypsum board partitions, where cable wiring method may be used. Use UL-listed plenum cable in environmental air spaces including plenum ceilings. Conceal cable and raceway wiring except in unfinished spaces.
- C. Install cables without damaging conductors, shield, or jacket. Nurse Call Cables must be color coded, labeled with nurse call manufactures name and easy to identify.
- D. Do not bend cables, in handling or in installing, to smaller radii than minimums recommended by manufacturer.
- E. Pull cables without exceeding cable manufacturer's recommended pulling tensions.
1. Pull cables simultaneously if more than one is being installed in same raceway.
 2. Use pulling compound or lubricant if necessary. Use compounds that will not damage conductor or insulation.
 3. Use pulling means, including fish tape, cable, rope, and basket-weave wire or cable grips, that will not damage media or raceway.
- F. Install exposed raceways and cables parallel and perpendicular to surfaces or exposed structural members, and follow surface contours. Secure and support cables by bridal rings, or similar fittings designed and installed so as not to damage cables. Secure cable at intervals not exceeding 30 inches and not more than 6 inches from cabinets, boxes, or fittings.
- G. Wiring within Enclosures: Provide adequate length of conductors. Bundle, lace, and train conductors to terminal points with no excess. Provide and use lacing bars in cabinets.
- H. Separation of Wires: Separate speaker-microphone, line-level, speaker-level, and power-wiring runs. Run in separate raceways or, if exposed or in same enclosure, provide 12-inch minimum separation between conductors to speaker microphones and adjacent parallel power and telephone wiring. Provide separation as recommended by equipment manufacturer for other conductors.
- I. Splices, Taps, and Terminations: Make splices, taps, and terminations on numbered terminal strips in junction, pull, and outlet boxes, terminal cabinets, and equipment enclosures. Install terminal cabinets where there are splices, taps, or terminations for eight or more conductors.
- J. Impedance and Level Matching: Carefully match input and output impedances and signal levels at signal interfaces. Provide matching networks if required.
- K. Identification of Conductors and Cables: Retain color-coding of conductors and apply wire and cable marking tape to designate wires and cables so all media are identified in coordination with system wiring diagrams. Label stations, controls, and indications using approved consistent nomenclature.

1. Label each cable within 4 inches of each termination and tap, where it is accessible in a cabinet or junction or outlet box, and elsewhere as indicated.
2. Label exposed cables at intervals not exceeding 15 feet.
3. Prepare cable administration drawings to show building floor plans with cable administration point labeling. Identify labeling convention and show labels for terminal hardware and positions, cables, stations and devices and equipment grounding conductors.

3.2 GROUNDING

- A. Ground cable shields and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other signal impairments.
- B. Signal Ground Terminal: Locate at main equipment cabinet. Isolate from power system and equipment grounding except at connection to main building ground bus.
- C. Grounding Provisions: Comply with requirements in Division 16 Section "Grounding."

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized Certification representative to inspect test, and adjust field-assembled components and equipment installation, including connections and to assist in field testing. Report results in writing.
- B. Test Procedure: Comply with the following:
 1. Schedule tests a minimum of seven days in advance of performance of tests.
 2. Report: Submit a written record of test results.
 3. Operational Test: Perform an operational system test, and demonstrate proper operations, adjustment, and sensitivity of each station. Perform tests that include originating station-to-station and all-call messages and pages at each nurse call station. Verify proper routing, volume levels, and freedom from noise and distortion. Test each available message path from each station on the system. Meet the following criteria:
 - a. Speaker Output: 90 dB plus or minus 3 dB, 300 to 3000 Hz, reference level threshold of audibility 0 dB at 0.02 millipascals of sound pressure.
 - b. Gain from patient's bedside station to nurse station, with distortion less than 65 dB (plus or minus 3 dB, 300 to 3000 Hz).
 - c. Signal-to-Noise Ratio: Hum and noise level at least 45 dB below full output.
4. Test Procedure:
 - a. Frequency Response: Determine frequency response of two transmission paths by transmitting and recording audio tones.
 - b. Signal-to-Noise Ratio: Measure the ratio of signal to noise of the complete system at normal gain settings, using the following procedure: Disconnect a speaker microphone and replace it in the circuit with a signal generator using a 1000-Hz signal. Measure the ratio of signal to noise and repeat the test for four speaker microphones.
 - c. Distortion Test: Measure distortion at normal gain settings and rated power. Feed signals at frequencies of 300, 400, 1000, and 3000 Hz into each nurse call equipment amplifier, and measure the distortion in the amplifier output.

- C. Retesting: Rectify deficiencies indicated by tests and completely retest work affected by such deficiencies at Contractor's expense. Verify by the system test that the total system meets these Specifications and complies with applicable standards. Report results in writing.
- D. Inspection: Verify that units and controls are properly labeled and interconnecting wires and terminals are identified.

3.4 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting sound levels and controls to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal operating hours for this purpose.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel and caregiver staff to adjust, operate, and maintain nurse call equipment.

3.6 TRAINING

- A. Provide training of Owners personnel for programming of system and devices. Factory training of Owners direct employees at the factory must be free of charge and open to unlimited owner representatives.

END OF SECTION 16725