

I. Statement Of Work (SOW)

II. Contract Title. New installation of a Nurse Call/ Code Blue System for 7th Floor Surgical Unit.

III. Background. A nurse call system is a vital communication method in patient care areas. The previous Executone system in this area was no longer supported for service or parts. All cabling and equipment shall be removed in this project. There will be additional procedure and recovery rooms available when expansion is complete.

IV. Scope.

A. The contractor shall:

1. Provide design, engineer, furnish, install, connect complete, test, certify and guarantee the new Code Blue/nurse call system for the Ambulatory Surgery Department located on the 7th floor of B-wing. This contractor shall remove the existing nurse call devices, cabling, and headend equipment that was used for this system.
2. This project will include a new patient/staff signaling devices for 30 locations within the 7B area, and required head-end equipment to operate these and future devices in this wing. **See the attachment** indicating the types of device required for each room, and its room location on 7th floor.
3. Provide materials and equipment to install a complete nurse system that seamlessly ties into our existing ASCOM Telligence Nurse Call System. This system currently exists on the 8th floor (ICU) and 6A with head-end software which resides in the 9th floor rack. Code blue signals from this system are displayed/annunciated at the Switchboard that is located in Building 2.
4. Utilize all existing pull and back boxes from the previous existing installation where possible. If existing raceways will not be adequate, and/or new devices require larger back-boxes or conduits, this contractor shall provide and install new EMT, and flex conduit down walls to appropriate locations.

B. Contractor qualifications include:

1. The Original Equipment Manufacturer (OEM) shall have had experience with three (3) or more installations of Nurse Call systems of comparable size and interfacing complexity with regards to type and design as specified herein. Each of these installations shall have performed satisfactorily for at least one (1) year after final

acceptance by the user. Include the names, locations and point of contact for these installations as a part of the submittal.

2. The Contractor shall submit certified documentation that they have been an authorized distributor and service organization for the Original Equipment Manufacturer (OEM) for a minimum of three (3) years. The Contractor shall be authorized by the OEM to pass thru the OEM's warranty of the installed equipment to VA. In addition, the OEM and Contractor shall accept complete responsibility for the design, installation, certification, operation, and physical support for the System. This documentation, along with the System Contractor and OEM certifications must be provided in writing as part of the Contractor's Technical submittal.

3. The Contractor's Communications Technicians assigned to the System shall be fully trained, qualified, and certified by the OEM on the engineering, installation, operation, and testing of the System. The Contractor shall provide formal written evidence of current OEM certification(s) for the installer(s) as a part of the submittal or to the VA Project Manager before being allowed to commence work on the System.

4. The Contractor shall display all applicable national, state and local licenses.

5. The Contractor shall submit copy (s) of Certificate of successful completion of OEM's installation/training school for installing technicians of the System's Nurse Call and/or Code Blue equipment being proposed.

C. The installation shall comply fully with all governing authorities, laws and ordinances, regulations, codes and standards, including, but not limited to:

1. United States Federal Law:

a. Departments of:

1) Commerce, Consolidated Federal Regulations (CFR), Title 15 – Under the Information Technology Management Reform Act (Public Law 104-106), the Secretary of Commerce approves standards and guidelines that are developed by the:

a) Chapter II, National Institute of Standards Technology (NIST – formerly the National Bureau of Standards). Under Section 5131 of the Information Technology Management Reform Act of 1996 and the Federal Information Security Management Act of 2002 (Public Law 107-347), NIST develops – Federal Information Processing Standards Publication (FIPS) 140-2—Security Requirements for Cryptographic Modules.

b) Chapter XXIII, National Telecommunications and Information Administration (NTIA – aka 'Red Book') Chapter 7.8 / 9; CFR, Title 47 Federal communications Commission (FCC) Part 15, Radio Frequency Restriction of Use and Compliance in "Safety of Life" Functions & Locations.

2) Health, (Public Law 96-88), CFR, Title 42, Chapter IV Health & Human Services, CFR, Title 46, Subpart 1395(a)(b) JCAHO "a hospital that meets JCAHO accreditation is deemed to meet the Medicare conditions of Participation by meeting Federal Directives:"

a) All guidelines for Life, Personal and Public Safety; and, Essential and Emergency Communications.

3) Labor, CFR, Title 29, Part 1910, Chapter XVII - Occupational Safety and Health Administration (OSHA), Occupational Safety and Health Standard:

a) Subpart 7 - Definition and requirements (for a NRTL – 15 Laboratory's, for complete list, contact (http://www.osha.gov/dts/otpca/nrtl/faq_nrtl.html):

- 1) UL:
 - a) 65 – Standard for Wired Cabinets.
 - b) 83-03 – Standard for Thermoplastic-Insulated Wires and Cables.
 - c) 467-01 – Standard for Electrical Grounding and Bonding Equipment
 - d) 468 – Standard for Grounding and Bonding Equipment.
 - e) 486A-01 – Standard for Wire Connectors and Soldering Lugs for Use with Copper Conductors
 - f) 486C-02 – Standard for Splicing Wire Connectors.
 - g) 514B-02 – Standard for Fittings for Cable and Conduit.
 - h) 1069 – Hospital Signaling and Nurse Call Equipment.
 - i) 1449 – Standard for Transient Voltage Surge Suppressors.
 - j) 1479-03 – Standard for Fire Tests of Through-Penetration Fire Stops.
 - k) 1666 – Standard for Wire/Cable Vertical (Riser) Tray Flame Tests.
 - l) 1863 – Standard for Safety, Communications Circuits Accessories.
 - m) 60950-1/2 – Information Technology Equipment – Safety.
- 2) Canadian Standards Association (CSA): same tests as for UL.
- 3) Communications Certifications Laboratory (CCL): same tests as for UL.
- 4) Intertek Testing Services NA, Inc. (ITSNA formerly Edison Testing Laboratory [ETL]): same tests as for UL.
 - b) Subpart 35 – Compliance with NFPA 101 – Life Safety Code.
 - c) Subpart 36 - Design and construction requirements for exit routes.
 - d) Subpart 268 - Telecommunications.
 - e) Subpart 305 - Wiring methods, components, and equipment for general use.
- 4) Veterans Affairs (Public Law No. 100-527), CFR, Title 38, Volumes I & II:
 - a) Office of Telecommunications:
 - 1) Handbook 6100 – Telecommunications.
 - a) Spectrum Management FCC & NTIA Radio Frequency Compliance and Licensing Program.
 - b) Special Communications Proof of Performance Testing, VACO Compliance and Life Safety Certification(s).
 - c) Office of Cyber and Information Security (OCIS):
 - 1) Handbook 6500 - Information Security Program.

2) Wireless and Handheld Device Security Guideline
Version 3.2, August 15, 2005.

a) VA's National Center for Patient Safety –
Veterans Health Administration Warning
System, Failure of Medical Alarm Systems
using Paging Technology to Notify Clinical
Staff, July 2004.

2. National Codes:

a. American Institute of Architects (AIA): Guidelines for Healthcare Facilities.

b. American National Standards Institute/Electronic Industries

Association/Telecommunications Industry Association (ANSI/EIA/TIA):

1) 568-B - Commercial Building Telecommunications Wiring
Standards:

a) B-1 – General Requirements.

b) B-2 – Balanced twisted-pair cable systems.

c) B-3 - Fiber optic cable systems.

2) 569 - Commercial Building Standard for Telecommunications
Pathways and Spaces.

3) 606 – Administration Standard for the Telecommunications
Infrastructure of Communications Buildings.

4) 607 – Commercial Building Grounding and Bonding Requirements
for Telecommunications.

5) REC 127-49 – Power Supplies.

6) RS 270 – Tools, Crimping, Solderless Wiring Devices,
Recommended Procedures for User Certification.

c. American Society of Mechanical Engineers (ASME):

1) Standard 17.4 – Guide for Emergency Personnel.

2) Standard 17.5 – Elevator & Escalator Equipment (prohibition of
installing non-elevator equipment in Elevator Equipment Room /
Mechanical Penthouse).

d. American Society of Testing Material (ASTM):

1) D2301-04 - Standard Specification for Vinyl Chloride Plastic
Pressure Sensitive Electrical Insulating Tape.

e. Building Industries Communications Services Installation (BICSI):

1) All standards for smart building wiring, connections and devices for
commercial and medical facilities.

2) Structured Building Cable Topologies.

3) In consort with ANSI/EIA/TIA.

f. Institute of Electrical and Electronics Engineers (IEEE):

1) C62.41 – Surge Voltages in Low-Voltage AC Power Circuits.

g. NFPA:

1) 70 - National Electrical Code (current date of issue) – Articles 517,
645 & 800.

2) 77 – Recommended Practice on Static Electricity.

3) 99 - Healthcare Facilities.

4) 101 - Life Safety Code.

5. Accreditation Organization(s):

a. Joint Commission on Accreditation of Hospitals Organization (JCAHO) – Section VI,
Part 3a – Operating Features.

V. Specific Tasks.

A. Codes and Permits

1. Provide all necessary permits and schedule all inspections as identified in the contract's milestone chart, so that the system is proof of performance tested, certified and approved by VA and ready for operation on a date directed by the Owner.
2. The contractor is responsible to adhere to all codes described herein and associated contractual, state and local codes.

B. Scheduling

1. After the award of contract, the Contractor shall prepare a detailed schedule (aka milestone chart) using "Microsoft Project" software or equivalent. The Contractor Project Schedule (CPS) shall indicate detailed activities for the projected life of the project. The CPS shall consist of detailed activities and their restraining relationships. It will also detail manpower usage throughout the project.
2. It is the responsibility of the Contractor 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.

C. Review of contract drawings and equipment data submittals (aka technical submittals)

(Note: The Contractor is encouraged, but not required, to submit separate technical submittal(s) outlining alternate technical approach(s) to the system requirements stated herein as long as each alternate technical document(s) is complete, separate, and submitted in precisely the same manner as outlined herein. VA will review and rate each received alternate submittal, which follows this requirement, in exactly the same procedure as outlined herein. Partial, add-on, or addenda type alternates will not be accepted or reviewed.)

1. Submit at one time within 10 days of contract awarding, drawings and product data on all proposed equipment and system. Check for compliance with contract documents and certify compliance with Contractor's "APPROVED" stamp and signature.
2. Support all submittals with descriptive materials, i.e., catalog sheets, product data sheets, diagrams, and charts published by the manufacturer. These materials shall show conformance to specification and drawing requirements.
3. Where multiple products are listed on a single cut-sheet, circle or highlight the one that you propose to use. Provide a complete and thorough equipment list of equipment expected to be installed in the system, with spares, as a part of the submittal. Special Communications (TVE-005OP3B) will not review any submittal that does not have this list.
4. Provide four (4) copies to the VA Project Manager for technical review. The VA Project Manager will provide a copy to the offices identified in Paragraph 1.3.C, at a minimum for compliance review as described herein where each responsible individual(s) shall respond to the VA Project Manager within 10 days of receipt of their acceptance or rejection of the submittal(s).
5. Surveys Required as a Part of The Technical Submittal:
 - a. The Contractor shall provide the following System surveys that depict various system features and capacities required in addition to the on-site survey requirements described herein (see Specification Paragraph 3.3). Each survey shall be in writing and contain the following information (the formats are suggestions and may be used for the initial Technical Submittal Survey requirements), as a minimum:

i. Nurse Call Cable System Design Plan:

1) An OEM and contractor designed functioning Nurse Call System cable plan to populate the entire empty conduit/pathway distribution systems provided as a part of Specification 27 11 00 shall be provided as a part of the technical proposal. A specific functioning Nurse Call: cable, interfaces, J-boxes and back boxes shall coincide with the total growth items as described herein. It is the Contractor's responsibility to provide the Systems' entire Nurse Call cable and accessory requirements and engineer a functioning Nurse Call distribution system and equipment requirement plan for the devices and stations indicated on the drawings.

6. Installation - Install new Nurse Call system within current conduit raceways. Utilize all existing pull and back boxes from the previous existing installation where possible. If existing raceways will not be adequate, and/or new devices require larger back-boxes or conduits, this contractor shall provide and install new EMT, and flex conduit down walls to appropriate locations.

A. General:

1. Execute work in accordance with National, State and local codes, regulations and ordinances.

2. Install work neatly, plumb and square and in a manner consistent with standard industry practice. Carefully protect work from dust, paint and moisture as dictated by site conditions. The Contractor will be fully responsible for protection of his work during the construction phase up until final acceptance by the Owner.

3. Install equipment according to OEM's recommendations. Provide any hardware, adaptors, brackets, rack mount kits or other accessories recommended by OEM for correct assembly and installation.

4. Secure equipment firmly in place, including receptacles, speakers, equipment racks, system cables, etc.

a. All supports, mounts, fasteners, attachments and attachment points shall support their loads with a safety factor of at least 5:1.

b. Do not impose the weight of equipment or fixtures on supports provided for other trades or systems.

c. Any suspended equipment or associated hardware must be certified by the OEM for overhead suspension.

d. The Contractor is responsible for means and methods in the design, fabrication, installation and certification of any supports, mounts, fasteners and attachments.

5. Finishes for any exposed work such as plates, racks, panels, speakers, etc. shall be approved by the Architect, Owner and TVE 005OP3B.

6. Coordinate cover plates with field conditions. Size and install cover plates as necessary to hide joints between back boxes and surrounding wall. Where cover plates are not fitted with connectors, provide grommets holes in size and quantity required. Do not allow cable to leave or enter boxes without cover plates installed.

7. Active electronic component equipment shall consist of solid state components, be rated for continuous duty service, comply with the requirements of FCC standards for telephone and data equipment, systems, and service.

8. Color code all distribution wiring to conform to the Nurse Call Industry Standard, EIA/TIA, and this document, whichever is the more stringent. At a minimum, all equipment, cable duct and/or conduit, enclosures, wiring, terminals, and cables shall be clearly and permanently labeled according to and using the provided record drawings, to facilitate installation and maintenance.

9. Connect the System's primary input AC power to the Facility's Critical Branch of the Emergency AC power distribution system as shown on the plans or if not shown on the plans consult with VA Project Manager regarding a suitable circuit location prior to bidding.

B. Equipment Cabinets:

1. Provide security covers for all devices not requiring routine operator control.
2. Provide vent panels and cooling fans as required for the operation of equipment within the OEM's specified temperature limits. Provide adequate ventilation space between equipment for cooling. Follow manufacturer's recommendations regarding ventilation space between amplifiers.
3. Ensure a minimum of 36 inches in front of each cabinet to comply with OSHA Safety Standards.

C. Wiring Practice - in addition to the MANDATORY infrastructure requirements outlined in VA Construction Specifications 27 10 00 – TIP Structured Communications Cabling, 27 11 00, the following additional practices shall be adhered to:

1. Comply with requirements for raceways and boxes specified in Division 26 Section "Raceway and Boxes for Electrical Systems."
2. Execute all wiring in strict adherence to the National Electrical Code, applicable local building codes and standard industry practices.
3. Where raceway is to be EMT (conduit), wiring of differing classifications shall be run in separate conduit. Where raceway is to be an enclosure (rack, tray, wire trough, utility box) wiring of differing classifications which share the same enclosure shall be mechanically partitioned and separated by at least four (4) inches. Where wiring of differing classifications must cross, they shall cross perpendicular to one another.
4. Do not splice wiring anywhere along the entire length of the run. Make sure cables are fully insulated and shielded from each other and from the raceway for the entire length of the run.
5. Do not pull wire through any enclosure where a change of raceway alignment or direction occurs. Do not bend wires to less than radius recommended by manufacturer.
6. Replace the entire length of the run of any wire or cable that is damaged or abraded during installation. There are no acceptable methods of repairing damaged or abraded wiring.
7. Use wire pulling lubricants and pulling tensions as recommended by the OEM.
8. Use grommets around cut-outs and knock-outs where conduit or chase nipples are not installed.
9. Do not use tape-based or glue-based cable anchors.
10. Field wiring entering equipment cabinets shall be terminated as follows:
 - a. Provide OEM directed service loops at harness break-outs and at plates, panels and equipment. Loops should be sufficient to allow plates, panels and equipment to be removed for service and inspection.
 - b. Line level and speaker level wiring may be terminated inside the equipment rack using specified terminal blocks (see "Products.") Provide 15% spare terminals inside each rack. Microphone level wiring may only be

terminated at the equipment served.

c. Employ permanent strain relief for any cable with an outside diameter of 1" or greater.

11. Make all connections as follows:

a. For crimp-type connections, use only tools that are specified by the manufacturer for the application.

b. Use only insulated spade lugs on screw terminals. Spade lugs shall be sized to fit the wire gauge. Do not exceed two lugs per terminal.

c. Wire nuts, electrical tape or "Scotch Lock" connections are not acceptable for any application.

12. Noise filters and surge protectors shall be provided for each equipment interface cabinet, switch equipment cabinet, control console, local, and remote active equipment locations to ensure protection from input primary AC power surges and noise glitches are not induced into low Voltage data circuits.

13. Wires or cables to be installed outside of conduit, cable trays, wireways, cable duct, etc:

a. Only when specifically authorized as described herein, will wires or cables be identified and approved to be installed outside of conduit. The wire or cable runs shall be UL rated plenum and OEM certified for use in air plenums.

b. Wires and cables shall be hidden, protected, fastened and tied at 600 mm (24 in.) intervals, maximum, as described herein to building structure.

c. Closer wire or cable fastening intervals may be required to prevent sagging, maintain clearance above suspended ceilings, remove unsightly wiring and cabling from view and discourage tampering and vandalism. Wire or cable runs, not provided in conduit that penetrate outside building walls, supporting walls, and two hour fire barriers shall be sleeved and sealed with an approved fire retardant sealant.

d. Wire or cable runs to system components installed in walls (i.e.: volume attenuators, circuit controllers, signal, or data outlets, etc.) may, when specifically authorized by the RE, be fished through hollow spaces in walls and shall be certified for use in air plenum areas.

e. Completely test all of the cables after installation and replace any defective cables.

f. Wires or cables that are installed outside of buildings shall be in conduit, secured to solid building structures. If specifically approved, on a case by case basis, to be run outside of conduit, the wires or cables shall be installed, as described herein. The bundled wires or cables must: Be tied at not less than 460 mm (18 in.) intervals to a solid building structure; have ultra violet protection and be totally waterproof (including all connections). The laying of wires or cables directly on roof tops, ladders, drooping down walls, walkways, floors, etc. is not allowed and will not be approved.

D. Cable Installation - Cable Installation - In addition to the mandatory infrastructure requirements outlined in VA Construction Specifications 27 10 00 – Structured Cabling, the following additional practices shall be adhered to:

1. Support cable on maximum 2'-0" centers. Acceptable means of cable support are cable tray, j-hooks, and bridal rings. Velcro wrap cable bundles loosely to the means of support with plenum rated Velcro straps. Plastic tie wraps are not acceptable as a means to bundle cables.

2. Run cables parallel to walls.

3. Install maximum of 10 cables in a single row of J-hooks. Provide necessary rows of J-hooks as required by the number of cables.

4. Do not lay cables on top of light fixtures, ceiling tiles, mechanical equipment, or ductwork. Maintain at least 2'-0" clearance from all shielded electrical apparatus.

5. All cables shall be tested after the total installation is fully complete. All test results are to be documented. All cables shall pass acceptable test requirements and levels. Contractor shall remedy any cabling problems or defects in order to pass or comply with testing. This includes the re-pull of new cable as required at no additional cost to the Owner.

6. Ends of cables shall be properly terminated on both ends per industry and OEM's recommendations.

7. Provide proper temporary protection of cable after pulling is complete before final dressing and terminations are complete. Do not leave cable lying on floor. Bundle and tie wrap up off of the floor until you are ready to terminate.

8. Terminate all conductors; no cable shall contain unterminated elements. Make terminations only at outlets and terminals.

9. Splices, Taps, and Terminations: Arrange on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Cables may not be spliced.

10. Bundle, lace, and train conductors to terminal points without exceeding OEM's limitations on bending radii. Install lacing bars and distribution spools.

11. Cold-Weather Installation: Bring cable to room temperature before de-reeling. Heat lamps shall not be used.

12. Cable shall not be run through structural members or be in contact with pipes, ducts, or other potentially damaging items.

E. Labeling: Provide labeling in accordance with ANSI/EIA/TIA-606-A. All lettering for Nurse Call and/or Code Blue circuits shall be stenciled using laser printers.

1. Cable and Wires (Hereinafter referred to as "Cable"): Cables shall be labeled at both ends in accordance with ANSI/EIA/TIA-606-A. Labels shall be permanent in contrasting colors. Cables shall be identified according to the System "Record Wiring Diagrams."

2. Equipment: System equipment shall be permanently labeled with contrasting plastic laminate or Bakelite material. System equipment shall be labeled on the face of the unit corresponding to its source.

a. Clearly, consistently, logically and permanently mark switches, connectors, jacks, relays, receptacles and electronic and other equipment.

b. Engrave and paint fill all receptacle panels using 1/8" (minimum) high lettering and contrasting paint.

c. For rack-mounted equipment, use engraved Lamacoid labels with white 1/8" (minimum) high lettering on black background. Label the front and back of all rack-mounted equipment.

3. Conduit, Cable Duct, and/or Cable Tray: The Contractor shall label all conduit, duct and tray, including utilized GFE, with permanent marking devices or spray painted stenciling a minimum of 3 meters (10 ft.) identifying it as the System. In addition, each enclosure shall be labeled according to this standard.

4. Where multiple pieces of equipment reside in the same rack group, clearly and logically label each indicating to which room, channel, receptacle location, etc. they correspond.

5. Permanently label cables at each end, including intra-cabinet connections. Labels shall be covered by the same, transparent heat-shrink tubing covering the end of the overall jacket. Alternatively, computer generated labels of the type which include a

clear protective wrap may be used.

6. Contractor's name shall appear no more than once on each continuous set of racks. The Contractor's name shall not appear on wall plates or portable equipment.

7. Ensure each OEM supplied item of equipment has appropriate UL Labels Marks for the service the equipment is performed permanently attached or marked to a non-removal board in the unit. Equipment installed not bearing these UL marks will not be allowed to be a part of the system. The contractor shall bear all costs required to provide replacement equipment with approved UL marks.

F. Fireproofing

1. Where Nurse Call and/or Code Blue wires, cables and conduit penetrate fire rated walls, floors and ceilings, fireproof the opening.

2. Provide conduit sleeves (if not already provided by electrical contractor) for cables that penetrate fire rated walls and Telecommunications Rooms floors and ceilings. After the cabling installation is complete, install fire proofing material in and around all conduit sleeves and openings. Install fire proofing material thoroughly and neatly. Seal all floor and ceiling penetrations.

3. Use only materials and methods that preserve the integrity of the fire stopping system and its rating.

G. Grounding

1. Ground Nurse Call and/or Code Blue equipment to eliminate shock hazard and to minimize ground loops, common mode returns, noise pickup, cross talk, and other impairments as specified in CFM Division 27, Section 27 05 26 – Grounding and Bonding for Communications Systems.

2. Do not use "3rd or 4th" wire internal electrical system conductors for communications signal ground.

3. Do not connect the signal ground to the building's external lightning protection system.

4. Do Not "mix grounds" of different systems.

All 120V power shall be provided for system head-end equipment prior to nurse call system installation.

5.1 Management Controls.

5.1.1 Integration Management Control Planning.

The Contractor shall continually employ interfacing methods that are approved by the OEM and VA. At a minimum, an acceptable interfacing method requires not only a physical and mechanical connection, but also a matching of signal, voltage, and processing levels with regard to signal quality and impedance. The interface point must adhere to all standards described herein for the full separation of Critical Care and Life Safety systems.

The System Contractor shall connect the System ensuring that all NFPA and UL Critical Care and Life Safety Circuit and System separation guidelines are satisfied. The System Contractor is not allowed to make any connections to the Telephone System. VA shall arrange for the interconnection between the MATV and Patient Bed Service Walls Systems with the appropriate responsible parties. System hardware shall consist of a nurse call/Code Blue patient communications network comprised of nurse consoles, control stations, staff and duty stations, room and corridor dome lights, pillow speakers/call cords, pull cord and/or emergency push

button stations, and wiring. The system shall be provided with the hardware and software for staff locator devices. 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 call/Code Blue patient communications network. It is not acceptable to utilize the telephone cable system for the control and distribution of nurse call (code Blue) signals and equipment.

The System is defined as Critical Service and the Code Blue functions is defined as Life Safety/Support by NFPA (re Part 1.1.A) and so evaluated by JCAHCO.

A. Intermediate Testing:

1. After completion of 30 – 40% of the installation of a head end cabinet(s) and equipment, one master stations, local and remote stations, and prior to any further work, this portion of the system must be pretested, inspected, and 1certified. Each item of installed equipment shall be checked to ensure appropriate UL Listing and Certification Labels are affixed as required by NFPA - Life Safety Code 101-3.2 (a) & (b), UL Nurse Call Standard 1069 and JCAHCO evaluation guidelines, and proper installation practices are followed. The intermediate test shall include a full operational test.
2. All inspections and tests shall be conducted by an OEM-certified contractor representative and witnessed by TVE-005OP3B if there is no local Government Representative that processes OEM and VA approved Credentials to inspect and certify the system. The results of the inspection will be officially recorded by the Government Representative and maintained on file by the COR, until completion of the entire project. The results will be compared to the Acceptance Test results. An identical inspection may be conducted between the 65 - 75% of the system construction phase, at the direction of the COR.

B. Pretesting:

1. Upon completing installation of the Nurse Call and/or Code Blue System, the Contractor shall align, balance, and completely pretest the entire system under full operating conditions.
2. Pretesting Procedure:
 - a. During the System Pretest the Contractor shall verify (utilizing approved test equipment) that the System is fully operational and meets all the System performance requirements of this standard.
 - b. The Contractor shall pretest and verify that all PSM System functions and specification requirements are met and operational, no unwanted aural effects, such as signal distortion, noise pulses, glitches, audio hum, poling noise, etc. are present. At a minimum, each of the following locations shall be fully pretested:
 - 1) Central Control Cabinets.
 - 2) Nurse Control Stations.
 - a) Master Stations
 - b) Patient Stations w/ code blue, staff assist, emergency and cancellation buttons.
 - c) Lavatory pull cord stations
 - 3) Dome Lights.
 - a) Corridors
 - 4) Electrical Supervision Panels/Functions/locations.
 - 5) All Networked locations.
 - 6) System interface locations (i.e. wireless, PA, telephone, etc.).
 - 7) System trouble reporting.
 - 8) System electrical supervision.

3. The Contractor shall provide four (4) copies of the recorded system pretest measurements and the written certification that the System is ready for the formal acceptance test shall be submitted to the COR.

C. Acceptance Test:

1. After the Nurse Call and/or Code Blue System has been pretested and the Contractor has submitted the pretest results and certification to the COR, then the Contractor shall schedule an acceptance test date and give the VA Project Manager 15 working days written notice prior to the date the acceptance test is expected to begin. The System shall be tested in the presence of a TVE 005OP3B and OEM certified representatives. The System shall be tested utilizing the approved test equipment to certify proof of performance and Life Safety / Critical Service compliance. The tests shall verify that the total System meets all the requirements of this specification. The notification of the acceptance test shall include the expected length (in time) of the test.
2. The acceptance test shall be performed on a "go-no-go" basis. Only those operator adjustments required to show proof of performance shall be allowed. The test shall demonstrate and verify that the installed System does comply with all requirements of this specification under operating conditions. The System shall be rated as either acceptable or unacceptable at the conclusion of the test. Failure of any part of the System that precludes completion of system testing, and which cannot be repaired in four (4) hours, shall be cause for terminating the acceptance test of the System. Repeated failures that result in a cumulative time of eight (8) hours to affect repairs shall cause the entire System to be declared unacceptable.
3. Retesting of the entire System shall be rescheduled at the convenience of the Government and costs borne by the Contractor at the direction of the COR.

D. Acceptance Test Procedure:

1. Physical and Mechanical Inspection:
 - a. The Nurse Call and Hospital Representative will tour all major areas where the Nurse Call and/or Code Blue System and all sub-systems are completely and properly installed to insure they are operationally ready for proof of performance testing. A system inventory including available spare parts will be taken at this time. Each item of installed equipment shall be checked to ensure appropriate UL certification labels are affixed.
 - b. The System diagrams, record drawings, equipment manuals, TIP Auto CAD Disks, intermediate, and pretest results shall be formally inventoried and reviewed.
 - c. Failure of the System to meet the installation requirements of this specification shall be grounds for terminating all testing.
2. Operational Test:
 - a. After the Physical and Mechanical Inspection, the central terminating and nurse call master control equipment shall be checked to verify that it meets all performance requirements outlined herein. A spectrum analyzer and sound level meter may be utilized to accomplish this requirement.
 - b. Following the central equipment test, a pillow speaker (or on board speaker) shall be connected to the central terminating and nurse call master control equipment's output tap to ensure there are no signal distortions such as intermodulation, data noise, popping sounds, erratic system functions, on any function.
 - c. The distribution system shall be checked at each interface, junction, and distribution point, first, middle, and last intersectional, room, and bed dome light in each leg to verify that the nurse call distribution system meets all system performance standards.

- d. Each MATV outlet that is controlled by a nurse call pillow speaker shall be functionally tested at the same time utilizing the Contractor's approved hospital grade HDTV receiver and TV remote control cable.
- e. Additionally, each installed emergency, patient, staff, duty, intersectional, room, and bed dome light, power supply, code one, and remote annunciator panels shall be checked insuring they meet the requirements of this specification.
- f. Once these tests have been completed, each installed sub-system function shall be tested as a unified, functioning and fully operating system. The typical functions are: nurse follower, three levels of emergency signaling (i.e. flashing red emergency, flashing white patient emergency, flashing white or combination lights for staff emergency, separate flashing code blue), minimum of 10 minutes of UPS operation, memory saving, minimum of ten station audio paging, canceling emergency calls at each originating station only, and storage and prioritizing of calls.
- g. Individual Item Test: The TVE 005OP3B Representative will select individual items of equipment for detailed proof of performance testing until 100% of the System has been tested and found to meet the contents of this specification. Each item shall meet or exceed the minimum requirements of this document.

3. Test Conclusion:

- a. At the conclusion of the Acceptance Test, using the generated punch list (or discrepancy list) the VA and the Contractor shall jointly agree to the results of the test, and reschedule testing on deficiencies and shortages with the COR. Any retesting to comply with these specifications will be done at the Contractor's expense.
- b. If the System is declared unacceptable without conditions, all rescheduled testing expenses will be borne by the Contractor.

E. Acceptable Test Equipment: The test equipment shall be furnished by the Contractor shall have a calibration tag of an acceptable calibration service dated not more than 12 months prior to the test.

All nurse call and Code Blue functions shall be annunciated at nurse stations. Additional annunciation shall be at all duty/staff stations indicated on the contract documents.

All calls originated from patient stations, either from the pillow speaker or call button on the station, shall communicate with both nurse stations.

The System shall be delivered free of engineering, manufacturing, installation, and functional defects. It shall be designed, engineered and installed for ease of operation, maintenance, and testing.

System firmware shall be the product of a reputable firmware OEM of record with a proven history of product reliability and sole control over all source code. Manufacturer shall provide, free of charge, product firmware/software upgrades for a period of two (2) years from date of acceptance by VA for any product feature enhancements. System configuration programming changes shall not require any exchange of parts and shall be capable of being executed remotely via a modem connection.

5.1.2 Contract Management.

Throughout progress of the Work, maintain an accurate record of changes in Contract

Documents. Vendor shall work with the VA provided electrical contractor to coordinate conduit placement. Upon completion of Work, transfer as-built records and changes to a set of Project Record Documents.

The floor plans shall be marked in pen to include the following:

- Each device specific locations.
- Conduit locations.
- Each interface and equipment specific location.
- Head-end equipment and specific location.
- Wiring diagram.
- Labeling and administration documentation.
- Warranty certificate.
- System test results.

The Contractor shall warrant the installation to be free from defect in material and workmanship for a period of one (1) year from the date of acceptance of the project by the owner.

The Contractor shall agree to remedy covered defects within four (4) hours of notification of major failures or within twenty-four (24) hours of notification for individual station related problems.

1. At a minimum, each distribution, interconnection, interface, terminating point and TCO shall be capable of supporting the Facility's Nurse Call and/or Code Blue System voice and data service as follows:
 - a. Shall be compliant with and not degrade the operating parameters of the Public Switched Telephone Network (PSTN) and the Federal Telecommunications System (FTS) at each PSTN and FTS interface, interconnection and TCO terminating locations detailed on the contract drawings.
 - b. The System shall provide the following minimum operational functions:
 - 1) Code Blue calls shall be cancelable at the calling station only. The nurse call master stations that manage Code Blue functions shall not have the ability to cancel Code Blue calls.
 - 2) Calls placed from any Code Blue station shall generate Code Blue emergency type audible and visual signals at each associated nurse control and duty station, respective dome lights and all local and remote annunciator panels. Calls placed from a bedside station shall generate emergency type visual signals at the bedside station and associated corridor light in addition to the previous stated stations and panels.
 - 3) Activating the silencing device at any location, while a Code Blue call or system fault is occurring shall mute the audible signals at the alarm location.
 - a) The audible alarm shall regenerate at the end of the selected time-out period until the call or fault is corrected.
 - b) The visual signals shall continue until the call is canceled and/or a fault is corrected. When the fault is corrected, all signals generated by the fault shall automatically cease, returning the System to a standby status.
 - c) Audible signals shall be regenerated in any local or remote annunciator panel that is in the silence mode, in the event an additional Code Blue call is placed in any Code Blue system.

- d) The additional Code Blue call shall also generate visual signals at all annunciators to identify the location of the call.
- 2. Each System Nurse Call location shall generate a minimum of distinct calls:
 - a. Routine: white flashing dome lights & master station color and audio tone,
 - b. Staff Assist/ Bathroom Assist: rapid white flashing dome lights & master station color and audio tone,
 - c. Emergency: Red flashing dome lights & master station color and audio tone,
 - d. Code Blue: Blue flashing dome lights and master station color and audio tone,
 - e. Each generated call shall be cancelable at ONLY the originating location.
- 3. HL7 Interface:
 - a. The system may support downloading and updating of patient data from the hospital admission system (or other database) via the HL7 standard. The data only has to travel one way, i.e. from the admission system to the nurse-call system.
 - b. Coordinate with the Owner the exact fields that shall be populated from the admissions system in the nurse-call system.
 - c. The Facility's LAN/WAN is not allowed for Nurses Call/Code Blue main wiring / function that must be a "stand alone primary cable infrastructure" as described herein.
 - d. Connections to the VA LAN/WAN for functional or operable conditions shall be allowed ONLY when the LAN/WAN system has been demonstrated and NFPA (at a minimum by TVE-005OP3B) Certified meeting Life Safety Standards.
 - e. Provide one (1) spare HL Interface unit.

Basis of design is Ascom Telligence Nurse Call System

Contractor is responsible for pricing all accessories and miscellaneous equipment required to form a complete and operating system. The equipment provided herein shall be as indicated on the drawings with the exception of the indicated spare equipment.

1 HC-PC-DSK2-7 Nurse Station IR Listview PC
 1 NGTELL40-S 4.0 base system bridge software
 4 HC-IPSWITCH8 head-end IP data switch
 1 NGGTWY2-H head-end power gateway
 2 NGTDSP-H nurse station & consultant room staff console
 17 HC-CL4 4-section LED corridor light
 21 HC-PSTN1-BED single patient station with built in 37pin bed receptacle & dual aux jack
 21 HC-BACABLE-36 break-away cable, bed to patient station
 21 HC-PSPKR-DA-D2 direct access digital pillow speaker with integrated head-phone jack
 30 HC-PP2-LAV pull for help lavatory & shower station
 9 HC-DUTY smart / enhanced staff/duty station
 15 HC-VSTN VoIP ColorTouch Staff / Workflow station
 1 VER-2037 IR system concentrator plus
 1 VER-2407 IR system collector
 35 VER-4432 IR system ceiling sensor
 1 VER-0005 IR system badge tester
 65 VER-1954 IR system badge (40RN & 25 CNA badges)

- A. Corridor Dome Lights
 - 1. Four (4) lamps.

2. Lamp colors available shall be white, green, yellow, blue, and red.
3. Lamp sockets shall be plug-in type connections.
4. Dome shall be easily removable to facilitate lamp replacement.
5. Mount in dual gang back box.

B. Pull-Cord / Emergency Stations

1. Pull-cord / Emergency Stations. When device is mounted in toilet locations, the enclosed watertight gasket shall be installed. Also included:
 - a. 10' nylon cord with solid plastic pendant at the end of the cord. Lamp shall flash when call is registered. Cut cord to desired length.
 - b. LED light on faceplate.
 - c. Cancel button on faceplate.
 - d. Calls initiated in toilet and shower rooms shall cause the associated corridor dome light to rapidly flash.
 - e. Stations shall mount in a single gang box.
 - h. Mounts in a two gang junction box or UL recognized equivalent.

E. Single Patient Station

1. Patient stations located in head board shall have the following features:
 - a. High-impact molded ABS faceplate and inserts.
 - b. (4) levels of service requirements
 - c. Monitor LED and call-assurance LED with cancel touch point.
 - f. Continuous supervision for station.
 - g. RJ connectors for easy service.
 - h. Speaker/microphone.
 - j. Provide universal pillow speaker with TV controls, 0-9 buttons for channel changing, volume up/down control and dual lighting controls, button for calling Nursing staff
 - k. Mounts in a three gang junction box or UL recognized equivalent.

G. Nursing Station Console

1. Color touch screen console master station shall have the following features:
 - a. Housing: High impact gray plastic.
 - b. Display: Programmable touch screen.
 - c. Desk mounted with handset.
 - d. Interfaces with the system via a wall mounted connector jack (included with console). Jack shall be mounted in a single gang back box.

H. Main Control Unit

1. Main Control Unit shall be comprised of the following:
 - a. Self contained unit.
 - b. Data and audio control for up to (4) L-Net connections
 - c. Supports up to (27) corridor lights
 - d. Support for up to (16) nurse consoles
 - e. Diagnostic LED indicators.
 - f. Mounted within the terminal cabinet.
2. Power supply with battery back-up shall have the following:
 - a. Self-contained unit.
 - b. Maintains full system operation during transition from normal to generator backup power.
 - c. Status LED indicators.
 - d. (9) Individually energy limited power outputs.

- e. Power output: Regulated 36V DC @ 2.4A total.
- 3. Terminal cabinet shall have the following features:
 - a. Terminal cabinet shall house the central logic equipment
 - b. Cabinet shall be flush or surface mounted as shown on the drawings.
- I. System Cable
 - 1. Wiring shall be Category 6. Verify jacket color with VA Project Manager prior to commencing installation.
- K. Software
 - 1. Provide software package for developing reports on timing of calls, answering/cancelling of calls.
- L. Spare Parts/Equipment
 - 1. Provide one spare device as attic stock once the original installation is completed of the following:
 - a. Single patient Station
 - b. Enhanced Duty Station
 - c. Pull Cord/Emergency Station
 - d. Corridor Dome Lights

Deliverables: **Contract Management Plan**
 Monthly Status Report

6. Performance Monitoring The Facility shall conduct weekly construction rounds and daily project manager contact during administrative hours.

7. Security Requirements All workers performing installation work at the facility shall be finger printed/badged before installation can start.

8. Government-Furnished Equipment (GFE)/Government-Furnished Information (GFI).
All workers will attend the one hour Infection Control Construction Safety Course offered once a month through the Facility Infection Control Department. Schedule will be furnished after workers complete security requirements.

9. Other Pertinent Information or Special Considerations.

- a. Identification of Possible Follow-on Work.
No follow on work was identified during planning sessions with vendor and facility representatives.
- b. Identification of Potential Conflicts of Interest (COI).
No COIs have been identified.
- c. Identification of Non-Disclosure Requirements.
None identified.
- d. Packaging, Packing and Shipping Instructions.

Shipments through the Facility Dock Area are only received weekdays, 0700-1500 with the exception of Federal Holidays.

e. Inspection and Acceptance Criteria.

Prior to final inspection and acceptance of the work, remove all debris, rubbish, waste material, tools, construction equipment, machinery and surplus materials from the project site and thoroughly clean your work area.

Before the project closeout date, the Contractor shall submit:

1. OEM Equipment Warranty Certificates.
2. Evidence of compliance with requirements of governing authorities such as the Low Voltage Certificate of Inspection.
3. Project record documents.
4. Instruction manuals and software that is a part of the system.
5. System Guaranty Certificate.

Contractor shall submit written notice that:

1. Contract Documents have been reviewed.
2. Project has been inspected for compliance with contract.
3. Work has been completed in accordance with the contract.

10. Risk Control

All workers will attend the one hour Infection Control Construction Safety Course offered once a month through the Facility Infection Control Department. Workers shall also submit information to undergo and pass a background check before any on-site work can begin. Schedule will then be furnished after workers complete security requirements.

11. Place of Performance.

The work will take place at the:

Wm. S. Middleton Memorial Veterans Hospital
2500 Overlook Terrace
Madison, WI 53705

*7th Floor B-wing Surgical Unit

12. Period of Performance

Design Start:

Installation Start Period: Daily start time approximately from 3:00PM to 11:00PM (or based on completion of patient care each day). If working on weekends or government holidays, then standard daytime work hours 7:00AM to 5:00PM shall apply.