**SECTION 27 51 23.70.CC**

**MEDICAL CLINIC ROOM STATUS AND EMERGENCY CALL SYSTEM**

1. GENERAL
	* + 1. RELATED SECTIONS
				1. Drawings and General Provisions of Contract including General and Supplemental Conditions and Division 1 Specification Section, apply to the work of this Section.
				2. Section 27 05 00 – Common Work Results for Communications Systems.
			2. SECTION INCLUDES
				1. Furnish and Install a complete and operable Medical Clinic Room Status and Emergency Call System as shown on the drawings and herein after described. The system shall be capable of high quality, reliable, and satisfactory operation as herein described.
				2. The system shall have the ability to integrate with a Pocket Paging and or Computer Intergrated Management and Reporting System.
				3. Furnish and Install all required Data Network Interfaces, Personal Computers, Software, and Associated Accessories required for a complete and operable system as herein described.
				4. One complete and operable system shall be provided and defined as all conduit, raceways, cables, back boxes, contacts, software, etc. to achieve a complete and functional system. Also included are all power supplies, hardware, and interfaces to equipment supplied by others. Documents do not show or list every item to be provided. When an item not shown or listed is clearly necessary for proper installation and operation of the equipment and systems, provide, install, and test/certify, the item at no increase in contract price.
			3. REFERENCES
				1. Published Codes, Standards, Tests, or Recommended Standards of the Trade, Industry, or Government Organizations apply to these sections include but are not limited to:

NFPA - National Fire Protection Association

NEC- National Electrical Code - NFPA 70

UL - Underwriter’s Laboratories, Inc.

ADA – Americans with Disabilities Act

EIA – Electronic Industry Association

NEMA – National Electrical Manufacturers Association

NSCA – Nation Systems Contractors Association – Best Practices

ASCII – American Standard Code for Information Interchange

ASTM - American Society for Testing and Materials

* + - 1. QUALITY ASSURANCE
				1. Qualifications:

The systems shall be the product of a manufacturer or an agency experienced in such work. The authorized representative of the manufacturer or aforementioned agency shall make the installation and connections of all equipment and test of the operation of the system.

All items of a given type shall be the product of the same manufacturer.

All items shall be of the latest technology, no discontinued models or products are acceptable.

Installers shall have a minimum of 5 years experience in the installation of similar systems on at least 10 projects of similar scope.

The Manufacturer or the Authorized Representative shall provide proof that within 60 miles of the project they maintain:

A full compliment of parts to support the installation.

Offer service by fully trained and qualified technicians during normal working hours.

Will supply parts and service without delay and at a reasonable cost.

* + - * 1. Substitutions:

All materials and equipment shall conform to these specifications. No substitute materials may be used unless previously accepted in writing by the Architect.

* + - * 1. Regulatory Requirements:

Comply with NEC as applicable to construction and installation of system components and wiring.

Conform to NFPA 70

Conform to HIPAA regulations relating to paging and public address systems.

Systems must be inspected and receive accreditation from all agencies such as OSHPOD and JCAHO if mandated by the owner. Suppliers of all systems must include all documentation and staff to support the owner during these inspections and certifications.

* + - 1. SUBMITTALS
				1. Refer to Section General Conditions and Related Sections for full details of submittal requirements
				2. Provide full service contact information including company name, address, contact name, and phone number of authorized representative. Provide written proof from the Manufacturer of major system components affirming that the representative is duly authorized and trained to supply, support, and service the equipment.
				3. Provide a complete list of all equipment to be furnished.
				4. Provide Product Data: For each equipment component shown on the riser and or wiring diagram.
				5. Provide complete written sequence of operation for all factions of all systems.
				6. Provide dimensioned detail drawings of all special assemblies including custom panels, mounting assemblies, and location.
				7. Provide System Riser Diagram including:

Room Status Stations

Annunciator / Master Stations

Corridor Lights

Zone Lights

Patient Stations

Pull Stations

Data Collection Modules

Data Interface Modules

Personal Computers

Power Supplies

* + - * 1. Provide Wiring Details of all connections between all systems components.
				2. Manufacturer Instructions: Provide manufacturer’s written installation instructions.
				3. Proposed training program, including name and qualification of trainer(s), schedule of training, curricula, and written training materials.
				4. Closeout Submittals

Refer to Section General Conditions and Related Sections for full details of closeout requirements

As-Built Drawings indicating actual location and connection of components.

Operation and maintenance manuals for each system and equipment component.

Executed warranty documentation.

* + - 1. DELIVERY, STORAGE AND HANDLING
				1. Refer to Section General Conditions and Related Sections for full details.
				2. Deliver materials and components in manufacturer’s original, unopened, undamaged containers with identification labels intact.
				3. Store materials as recommended by manufacturer.
				4. During construction all products must be protected from dust, dirt, and construction foreign matter including dents, bumps, and scratches.
			2. WARRANTY
				1. Refer to Section General Conditions and Related Sections for full details.
				2. The installing manufacturer’s representative shall guarantee all labor, parts, and installation for a period of 1 year from substantial completion or first beneficial use of the system.
				3. Provide manufacturer 2-year warranty for the intercommunication and program system.
				4. Upon written notification of unacceptable work or warrantee request the installing manufacturer’s representative shall provide qualified technicians and parts within 24 hours of notification.
1. PRODUCTS
	* + 1. MANUFACTURERS
				1. The following manufacturers are known to provide products that meet or exceed these specifications.

Tech Works, Henderson, Nevada, 800-813-1080, [www.tech4people.com](http://www.tech4people.com)

No known equal.

* + - 1. CLINIC ROOM STATUS SYSTEM
				1. System Description:

The Medical Clinic Room Status and Emergency Call System should allow doctors to know what patient is next and stay in touch with staff without tying them down to a nurse station. By combining corridor lights, system status panels and other patient call and monitoring devices, as herein listed, staff can be mobile while delivering quality service.

The Room Status System shall be a distributed processing intelligent network consisting of a combination of Intelligent Substations having four push buttons and four lights, Intelligent Corridor Lights having four lights, and Master Stations capable of displaying up to eight Substations. The buttons/lights shall be provided with custom printed color labeling per the Architect's instruction and clear adhesive Lexan faceplates to easily identify functions or staff. Annunciator panels with surface mounted or exposed labeling will be totally unacceptable under these specifications. The system shall be expandable up to 512 Substations on a single system.

A Doctor Follow/next patient feature shall be included to provide *flashing* light indication of the next room or patient in sequence of their reporting. The first light reporting in a row shall *slow flash* to indicate that it is the next patient or room ready of that color. When any subsequent light in that row reports in, it shall be indicated by a *steady* light until the current *slow flashing* light status is changed. The current *slow flashing* light shall change to *fast flash* when the same Substation's button is pushed a second time. The third button push from that Substation shall turn the light off. Any time a light that is in *slow flash* mode is changed to *fast flash* the next Substation in sequence shall change from *steady* to *slow flash*. If a room needs to be inserted in the next order, the associated color button on the Substation can be pressed twice within one second and it shall automatically be placed in the *next (*or *slow flash*) position.

The system shall use RS485 digital communication between intelligent devices. All Substations shall have two sets of dipswitches which allow addressing of each unit. One set of dipswitches will assign a Substation to a Master and the second set selects the column of lights on the Master to represent the Substation. Any Substation status change shall be reflected in the Master lights and annunciated by a tone. Any Masters, Substations, or Corridor Lights with the same address setting shall be totally interactive. This interaction shall allow multi-point control for tailoring a system to meet special needs.

Each restroom shall have and Emergency Pull Station next to the toilet and a corresponding corridor light outside above each door. The corridor light shall be red in color and indicate a call by a flashing light and indicate at the main annunciator location.

Each procedure room shall have a Patient Call Station with a call cord to allow the patient to call for help. Each patient station shall have an associated corridor light. The corridor light shall be red in color and indicate a call by a flashing light and indicate at the main annunciator location.

Integrated Management and Reporting System (IMR) shall be included to provide facility users with a Patient or Room Status tracking system and priority call indication. The IMR shall be a single hardware and software solution with a Linux computer built into the hardware. Each IMR includes 2 USB 2.0 ports for serial interface, 1 TCP/IP network interface, and VGA and Line Level Audio outputs so that the unit can connect directly to a Video Monitor with Speakers. No additional Servers shall be required. The IMR must be Windows 10 Compatible. The IMR system acts as a web based server to display the system activity on any product able to display a web browser. Through password protection users can access and print management reports to monitor productivity and patient activity. Other types of messaging such as Pocket Paging, or SMS Text Messaging shall also be available through this system on a point by point basis. Colors can have an associated WAV file to produce a sound associated with each color.

All user interface shall employ moisture and electrostatic resistance to provide reliable yet friendly operation.

Easy to install - The Medical Clinic Room Status and Emergency Call System shall utilize simple twisted-pair cable making this system simple to install and easy to modify or expand. Wiring for the Light Signaling System shall consist of two twisted pair network wiring from one device to the next. Size and type of wire shall be as recommended by the manufacturer of the system. Systems, which require a home run to a central equipment location will be totally unacceptable under this specification. The system shall be capable of spanning multiple floors and or remote buildings using the simple twisted-pair or fiber optic cable.

All wall mounted devices shall mount to industry standard electric boxes. Systems using custom back boxes will not be considered under these specifications.

The Out Patient Medical Clinic Room Status System shall be Tech Works CLINIC-CALL sometimes known as CC-Series.

* + - * 1. Components

Master / Annunciator Panels - The Clinic Call System Annunciator shall be a standard four gang electrical box mounting device constructed of ABS plastic with a water resistant Lexan face plate. A minimum of eight columns of four lights shall be provided to allow output from the system. An electronic tone shall sound whenever an emergency call is actives and can be permanently disable by the installer if desired. The Annunciator shall be an addressable intelligent electronic device requiring no more than 264 mA at 12 Volts DC for full operation. The system shall operate on two twisted pair parallel wiring. Any system that requires more than two twisted pair wire and is not installer programmable will not be considered under this specification.

The Clinic Call Annunciator panel shall be Tech Works Model CC2-AN-84-T.

Room Status Station - The Clinic-Call System Intelligent Room Status Station shall be a standard one gang electrical box mounting device constructed of ABS. A minimum of four lighted buttons shall indicate up to eight statuses of each room. The four lights/buttons shall be color-coded as *Red, Yellow, Green, and Blue* to easily identify functions and location of staff. The Corridor Light shall be an intelligent electronic device, addressable by the installer, requiring no more than 100 mA at 12 Volts DC for full operation. The system shall operate on two twisted pair parallel wiring. Any system that requires more than two twisted pair wire and is not installer programmable will not be considered under this specification

The Clinic Call System Room Status Station shall be Tech Works Model CC2-RS-4-B.

Corridor Dome Light - The Clinic-Call System Intelligent Corridor Light shall be a standard two gang electrical box mounting device constructed of ABS. A minimum of four LED lights shall indicate up to eight statuses of each room. The four lights/buttons shall be color-coded as *Red, Yellow, Green, and Blue* to easily identify functions and location of staff. The Corridor Light shall be an intelligent electronic device, addressable by the installer, requiring no more than 100 mA at 12 Volts DC for full operation. The system shall operate on two twisted pair parallel wiring. Any system that requires more than two twisted pair wire and is not installer programmable will not be considered under this specification.

The Clinic Call System Dome Lights shall be Tech Works Model CC2-DL-44-B

Zone Lights - The Clinic-Call System Intelligent Zone Light shall be a standard two gang electrical box mounting device constructed of ABS. A minimum of four LED lights shall indicate up to eight statuses of each group of rooms. The four lights/buttons shall be color-coded as *Red, Yellow, Green, and Blue* to easily identify functions and location of staff. The Zone Light shall be an intelligent electronic device, addressable by the installer, requiring no more than 100 mA at 12 Volts DC for full operation. The system shall operate on two twisted pair parallel wiring. Any system that requires more than two twisted pair wire and is not installer programmable will not be considered under this specification.

The Clinic-Call System Intelligent Zone Light shall be Tech Works CC2-ZL-BT

Help Station - The Clinic-Call System Push for Help Station shall be a standard one gang electrical box mounting device constructed of ABS plastic. A large Help button shall be included to place a Staff Needs Assistance Call to the System. A distinctive Cancel button shall be provided to reset the station. A call confirmation light shall be included to indicate that a call has been placed. The staff station shall be a passive electronic device requiring no more than 3 mA at 15 Volts DC for full operation.

The Clinic-Call System Push for Help Station shall be Tech Works CC2-PHS

Emergency Patient Call Stations –

The Clinic-Call System Patient Bed Station shall be a standard one gang electrical box mounting device constructed of ABS plastic. A large push for Help button shall be included with a ¼: phone Jack for a call cord to provide both local and remote push for help operation. A distinctive Cancel button shall be provided to reset the station. A call confirmation light shall be included to indicate that a call has been placed. The patient station shall be a passive electronic device requiring no more than 3 mA at 15 Volts DC for full operation.

The Clinic-Call System Patient Bed Station shall be Tech Works Model CC2-PBS

Patient Call Cords – The Emergency Call System Call Cord shall be a standard normally open contact device constructed of thermoplastic and shall include a 1/4 inch phone plug for quick connect to wall mounted Stations. The Push Button shall be a momentary non-locking assembly in a 2.375" long by 1.0" wide housing. The cord assembly shall be 0.25" in diameter with a plastic jacket and measure at least 7 feet in length. The device shall include a molded right angle 1/4 inch phone plug for connection to the signaling system and a security clip for attachment to patient furniture.

The Patient Call Cord shall be Tech Works PBC-7.

Emergency Pull Cord Call Stations - The Clinic-Call System Emergency Pull Station shall be a standard one gang electrical box mounting device constructed of ABS plastic. A large push for Help button shall be included with a durable nylon cord to provide both push and pull for help operation. A distinctive Cancel button shall be provided to reset the station. A call confirmation light shall be included to indicate that a call has been placed. The pull station shall be a passive electronic device requiring no more than 3 mA at 15 Volts DC for full operation.

The Clinic-Call System Emergency Pull Station shall be Tech Works Model CC2-EPS.

The Integrated Management and Reporting System (IMR) shall be a Linux based Status-Server that logs and displays Patient or Room Status. Any device with access to the IMR network, shall have password controlled access to view the graphics and system status from anywhere at any time. The IMR shall include the ability to send messaging such as Pocket Paging, or SMS Text Messaging to other devices on a point by point basis. Each point in the associated system shall be labeled according to the function or use of the associated point on the system.

The Integrated MManagement and Reporting System shall be Tech Works IMR.

Power Supply - The Light Signaling System shall be supplied with a 24-Volt Direct Current power supply capable of powering all devices, as shown on plans, simultaneously with a minimum of 25% reserve power. The power supply shall have isolated ground from DC power common and be UL/CSA Listed for use with alarm and signaling systems. A surface mounting metal bracket shall be included to house the power supply. This unit shall operate from an input of 100 to 240 Volts AC and supply a minimum of 3.75 Amps at 24-Volts DC.

The Light Signaling System Power Supply shall be Tech Works Model PS-2437A.

* + - 1. ACCESSORIES
				1. Wire and Cable

System Network Wire shall be 18 AWG stranded twisted two pair cable with overall jacket. Wire twist shall be industry standard audio twist per foot or greater. Jacket material shall be compliant with NFPA and NEC codes for the type of location in which the cable is installed.

All patch Cords shall be CAT6 type standard network patch cords.

All Adapters, Plugs, and connectors shall be included as required.

* + - * 1. Cable Management

Cable management shall be as shown on the plans.

Where not shown on the plans wire shall be open run through concealed spaces and dressed using tie-wraps and screw mount tie-wrap holders on all exposed open runs.

In all cases wire routing and cable management shall be compliant with NEC and all Codes, Standards, and Best Practices applicable.

1. EXECUTION
	* + 1. INSTALLATION
				1. The Contractor shall furnish and install all interconnected cable, equipment, miscellaneous parts and accessories to make a complete and fully operational system as described herein and as shown on the drawings.
				2. All cables shall be sized in accordance with manufactures recommended cabling requirements. All cable and wire shall be air plenum rated even if installed in conduit.
				3. Equipment shall be installed and wired in accordance with accepted engineering and installation practices. Only the highest degree of workmanship will be accepted. Install in accordance with Electronic Systems Technician (EST) best practices.
				4. All cables shall be run continuously and no splicing may be made in any cable run.
				5. Cable and wiring routed through inaccessible spaces or spaces where there is risk of damage to conductors shall be installed in conduit or raceways supplied by other sections of this specification.
				6. All cable and wiring shall be run concealed in ceiling spaces or surface raceways, except for in wiring closets such as the Main Distribution Frame (MDF).
				7. All cable and wiring shall be securely fastened to the permanent building structure. Cable and wire not installed in raceway shall be supported at regular intervals appropriate to the cable and wire size. Cable and wiring shall not lay loose on ceiling tiles or grids and shall not be suspended from or attached to existing conduit.
				8. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer have published torque tightening values for equipment connectors. Where manufacturer’s torque requirements are not indicated, tighten connectors and terminals to comply with tightening torque per NEC specification.
				9. The following circuit types shall be installed in their own conduits:

Microphone and control lines

Control lines

AC power lines

* + - * 1. Provide a #6 AWG insulated copper ground wire from the main equipment to the building main ground bus.
				2. Install in accordance with NFPA 70 and manufacturer recommended installation procedures.
			1. FIELD QUALITY CONTROL
				1. CLEANING

Clean all devices, cabinets, and housings as recommended by electronic industry manufacturer.

* + - * 1. Labeling

All wiring and connections must be clearly labeled using industry standard permanent marking devices. Contractor shall identify and tag all cables with permanent type markers to denote locations served.

* + - * 1. All user interfaces must be clearly and permanently labeled for their intended use. All front panel controls used in the normal operation of the system shall be clearly labeled using plastic laminate engraved labels or approved equal. Labels shall be firmly affixed to the panel or device. Dymo or Kroy tape adhesive backed lettering is not acceptable. Each major system component shall be labeled as to function and area served.
				2. Site Tests/Inspection

Post Occupancy testing: Test inputs and outputs of all devices to verify compliance with functionality of designed system.

Verify installed cable is free of opens grounds and shorts.

Verify ventilation for equipment is adequate for installed units.

* + - 1. DEMONSTRATION
				1. Provide instruction to the Owner or their appointed representative related to operation, maintenance and programming of all systems Training sessions shall be on-site, limited to 15 people maximum in any one session. Sessions shall last approximately one (1) hours each. In addition, Contractor shall provide a minimum of four (4) hours training for system administrator.
				2. Follow-up training must be provided on all systems, one (1) week after cutover.
				3. Provide demonstration and training by a staff member/trainer who is certified by the system manufacturer to provide training.
			2. FINAL CHECKOUT AND ACCEPTANCE:
				1. The Contractor shall verify that the system is complete and fully operational before requesting final approval and before scheduling system demonstration.
				2. This Contractor shall be available to demonstrate the operation and use of the system to the Architect/Engineer and to the Owner’s representatives.
				3. At the time of the demonstration, this Contractor shall furnish to the Owner one (1) complete record manuals.
				4. Substantial Completion of the system will start the warranty period for both material and labor.
			3. SYSTEM GUARANTEE:
				1. The Contractor shall provide the following regarding warranties and guarantees.

Extend the manufactures warranty to the owner. The owner understands that manufactures warranties will vary from manufacture to manufacture.

Provide one year of free maintenance on the system from date of substantial completion and the owner’s first beneficial use of the system.

END OF SECTION