

**CWSI  
ENGINEERING SPECIFICATIONS FOR FIRE ALARM  
APPLICATIONS FIRE ALARM BASE BID**

**SCOPE**

This engineering specification is intended to provide a complete and fully operational wireless fire alarm system in accordance with NFPA standards as set forth in the plans. The system shall be UL Listed,, California State Fire Marshal listed, and FM approved to the Requirements of NFPA Chapter Six 2002, and 2007 Editions, or Chapter 23 2010 edition of The National Fire Alarm Code. Listings will include Local, Remote Station, Protective Premise, Smoke Detector Monitor, Central Station, Manual, Waterflow, Supervisory and Auxiliary Services.

**GENERAL**

- A. The system shall provide for bi-directional radio frequency communication between all initiating devices, repeaters and control unit. Transmission format shall be Frequency Hopping Spread Spectrum with CRC data validation.
- B. The System and components shall be UL listed to the requirements of NFPA Chapter 6 2002, 2007 Edition and NFPA Chapter 23 2010 Edition. "Special Requirements For Low Power Radio (Wireless) Systems."
- C. Each initiating device shall be individually identified on the control unit by device type and location within the protected premises as determined by the owner or local authority having jurisdiction.
- D. The control unit shall separately identify each initiating device in both initial and continued alarm status.
- E. The control unit shall maintain a perpetual recall memory of the last 1000 alarm and supervisory signals, 1000 trouble signals, and 1000 test log signals in the exact order received and 2000 all event log.
- F. The control unit shall be combination listed UL 864 & UL 1730.
- G. All repeaters and initiating devices shall be monitored for

integrity every 200 seconds and any fault or failure shall be displayed identifying the exact device within 200 seconds at the control unit.

H. Serialized enrollment shall be the method of identifying transmitters and repeaters within the installation.

**The system as bid shall accomplish and/or meet the following minimum construction and performance criteria:**

- 1. The main control shall provide a visual display of each individual fire initiating device identified by device type and location within the building or complex by providing sensor point identification in lieu of zoned information.
- 2. Upon receipt by the control unit of an alarm from any fire initiating device, notification appliances and other equipment control functions shall be automatically activated within the building in accordance with the plans and specifications.
- 3. Upon receipt of alarm or supervisory signals, the main control unit shall activate a signal to be transmitted to the appropriate authorities as set forth herein and on the plans.
- 4. The installed system shall provide a bi-directional signaling path from each initiating device to the control unit.
- 5. Silencing of general alarm devices shall be possible only by authorized personnel entering a locked cabinet and operating the proper silencing switch.
- 6. Provide reconnection of existing equipment where indicated on the plans.
- 7. Provide for 20% future expansion in the main control unit.
- 8. All equipment shall meet the requirements of the latest edition of The National Fire Alarm Code or such edition as is currently adopted by the local authority having jurisdiction.
- 9. The fire alarm System Control Unit(s) shall be listed by Underwriters Laboratories, Inc. UL #864 and FM Approved.

10. All System Control Unit Accessories shall be UL listed 864 and FM Approved.

11. All initiating devices and transmitters shall be UL listed for their intended use. Smoke–Automatic Fire Detectors UL Listed 268 (UROX) and Non-Coded Boxes Manual Pull Stations UL Listed 38 (UNIU), and FM Approved.

12. Miscellaneous Notification Appliances shall carry their manufacturer’s listings.

13. Contractor shall furnish and install in accordance with manufacturer’s instructions; all components and materials required for the erection of a complete system as described herein and shown on the plans.

14. All wiring shall be new for this project and shall meet the requirements of the national, state, and local electrical codes.

15. Final connections of the control unit(s) shall be made under direct supervision of a manufacturer’s factory trained representative.

16. The contractor shall guarantee all labor and wiring free from mechanical and electrical defects for a period of one (1) year from the date of final acceptance.

17. Manufacturer shall provide a limited warranty for defects in labor and material for a period of two (2) years from date of shipment from the factory for control units, repeaters, initiating devices, and other system components manufactured by it.

## **1. EQUIPMENT GENERAL**

### **CP- 3000 & CP-3000D Control Units**

The system CP-3000 and CP-3000D Control Units shall utilize only listed wireless signaling devices and shall be UL Combination Listed 864 & 1730, The CP-3000D shall be FM Approved.

### **1-1.2 AR-3 Repeater & RB Relay Repeaters**

The repeaters shall be UL listed 864, and FM Approved

### **1-1.3 Initiating Devices**

The initiating devices shall be UL Listed and FM Approved for their intended use.

### **1-1.4 Miscellaneous Signaling Appliances**

These devices shall be listed for the intended use by their manufacturers.

## **1-2 System Components To Be Included**

### **1-2.1 Initiating Devices**

The fire system shall include, as determined by the Engineer, Local Authority Having Jurisdiction, and/or Owner any of the following initiating devices as indicated in the plans:

Photoelectric Smoke Detector  
Tandem Photoelectric Smoke Detectors  
Fixed Temperature Heat Detectors  
Rate of Rise Heat Detectors  
Manual Pull Stations  
Institutional Key-Operated Manual Stations  
Normally Open Supervised Wired Signaling Device

### **1-2.2 System Control Unit Accessories**

The main control unit, when utilized in conjunction with accessory signaling devices for the activation of conventional signaling circuits, notification appliances, activation of remote equipment, auxiliary control functions, elevator recall, etc., shall include any of the following control unit accessories:

Model AR-3 Repeater  
Models RB- 10 through Model RB-40 Relay Repeaters  
Model 300 Photoelectric Smoke Detector w/built in sounder  
Model 301 Tandem Photoelectric Smoke Detector w/built in sounder  
Model 302 Non-Audible Photoelectric Smoke Detector  
Model 310 Dual Action Manual Pull Station  
Model 340 & 340TS Supervised Fire Transmitters

### **1-2.3 Miscellaneous Signaling Appliances**

When control functions are desired requiring UL listing for fire, the following system components may be utilized in accordance with the manufacturer's specifications:

AR-3 Repeater w/60hr Battery Back Up  
RB-10 Relay Repeater w/10 Addressable Relays  
RB-20 Relay Repeater w/20 Addressable Relays  
RB-30 Relay Repeater w/30 Addressable Relays  
RB-40 Relay Repeater w/40 Addressable Relays

## CONTROL UNIT SPECIFICATIONS

**2-1** The Control Unit shall have the capability of 1024 addressable points displayed on a 5" LCD allowing for pinpoint status of all alarm, supervisory and trouble conditions.

**2-1.2** The Control Unit shall provide LED visual display of AC Power, Fire Alarm, Supervisory, Trouble, Signals Silenced, and System Test.

**2-1.3** The Control Unit shall provide programmable membrane buttons for Alarm, Supervisory and Trouble Acknowledgement, Signal Silence, Smoke Detector Silence, Strobe Silence, Panel Reset, Panel Test, and Horns On.

**2-1.4** Provide for 4 separate alarm types.

**2-1.5** Provide 24 hour or 60 Hour battery standby time followed by 5 minutes of alarm time.

**2-1.6** Provide a minimum of 4 NO alarm dry contact outputs, 2 form C trouble outputs and 1 form C programmable dry contact outputs.

**2-1.7** Provide a minimum of two selectable 12/24 volt field programmable NAC outputs.

**2-1.8** NAC outputs shall be either Class "A" (Style Z) or Class "B" (Style Y) field selectable.

**2-1.9** Provide for Auxiliary municipal city box connection with disconnect switch.

**2-1.10** The Control Unit shall be field programmable.

**2-1.11** History Event log of 1000 Alarm/Supervisory Signals, 1000 Trouble Signals, 1000 Test Log Signals and 2000 Event Log Signals.

**2-1.12** Where required have the capability of reporting point id communication to Central Station.

## REPEATER SPECIFICATIONS

**3-1** The repeater(s) shall be intelligent addressable devices capable of receiving, and retransmitting radio signals throughout the installation from initialing devices, control units, and other repeaters. The communication path will be true radio frequency technology utilizing air as the transmission and signal path.

**3-1.2** The Radio Frequency communication path shall be bi-directional utilizing dual transceiver technology with a transmission format of Frequency Hopping Spread Spectrum.

**3-1.3** Repeaters shall provide programmable NACs (Notification Appliance Circuit) which shall be field selectable either 12 or 24 volt DC, Class "A" (Style Z) or Class "B" (Style Y) operation.

**3-1.4** Repeaters shall have the ability to receive command signals from the Control Unit for both activation and restoration of its relay outputs.

**3-1.5** The repeater shall have the ability to provide up to 40 normal open dry contact programmable relays.

**3-1.6** Repeater shall be provide 60 hour battery standby time followed by 5 minutes of alarm time.

## 4. PERFORMANCE REQUIREMENTS

**4-1** Initiating Devices

**4-1.1** Each initiating device shall be UL listed and FM Approved and powered by an internal battery(s) as

specified to provide one year minimum operation.

**4-1.2** Each initiating device shall transmit two levels of alarm status. Upon activation, the device shall transmit a signal indicating a initial alarm. The signal shall be transmitted every 60 seconds while the device remains in alarm and until the device is automatically or manually restored.

**4-1.3** Each initiating device shall transmit a test signal evidencing its ability to communicate and verify that its signal strength is within the acceptable tolerance levels prescribed by the manufacturer to provide adequate transmission. Failure of the control unit to receive the test signal within 200 seconds will result in a trouble indication at the control unit.

**4-1.4** The internal power source of each initiating device shall be supervised and transmit a separate and distinct low battery signal when the battery voltage reaches the determined threshold set forth by UL. The initiating device shall be capable of full operation for a minimum of seven days after the initial low battery signal has been received at the control unit. This condition will report within 200 seconds.

**4-1.5** The removal of an initiating device from its mounting shall result in a separate and distinct tamper signal which shall be transmitted within 200 seconds and displayed at the control unit.

**4-1.6** When utilizing a wired fire transmitter, the wiring shall be supervised and any loss of wiring integrity shall be reported within 200 seconds at the control unit.

## 5. REPEATERS

**5-1** Each repeater shall be UL listed 864 and FM Approved and powered by a normal 120 VAC supply.

**5-1.2** In the event of primary power interruption, a signal shall be sent to the control unit indicating loss of primary ac power within 200 seconds. Trouble relay activation at the control unit will be delayed for 120 minutes and when power is restored the condition will self restore.

**5-1.3** The internal battery back-up power source of each repeater shall provide full operation for a minimum of sixty (60) hours in the event of a primary loss of power. When used in conjunction with notification appliances or other ancillary equipment, the repeater shall, in the event of a loss of primary power, be able to operate the NAC outputs or other equipment for a minimum of 5 minutes after 60 hour battery backup time.

**5-1.4** The repeater shall be supervised and transmit a separate and distinct low battery signal when the internal battery source reaches the predetermined low battery threshold as described by UL. This condition will display within 200 seconds at the control unit.

**5-1.5** The repeater shall transmit a test signal evidencing its ability to communicate and verify that its signal strength is within the acceptable tolerance levels prescribed by the manufacturer to provide adequate transmission. Failure of the control unit to receive the test signal within 200 seconds will result in a trouble indication at the control unit.

**5-1.6** Repeaters shall be installed in exact locations as determined by the site signal survey performed by a factory trained representative of the manufacturer.

**5-1.7** Repeaters shall be configured and located in a manner whereby each initiating device shall report to a repeater with acceptable signal strength reception. In addition, each repeater's transmission shall likewise be received by a repeater and or control unit with acceptable signal strength reception.

## 6. CONTROL UNIT

**6-1** Each Control Unit shall be UL listed 864 & 1730, FM Approved and powered by a normal 120 VAC supply.

**6-1.2** The panel "Power" LED shall be illuminated while primary power is provided. In the event of an interruption with the primary power source, the Trouble LED will flash accompanied by an audible alert. A trouble indication will be displayed. Trouble relay activation will be delayed for 120 minutes. This trouble is self restoring.

**6-1.3** The control unit shall provide for the display and

reporting of up to four separate alarm types, for up to 1024 reporting devices. All devices and repeaters will be individually identified by alarm and device type as well as their location.

**6-1.4** Alarms will be displayed in order of the oldest to the most recent received.

**6-1.5** Upon receipt of an alarm the Fire Alarm LED shall flash once a second accompanied by a steady tone.

**6-1.6** If programmed to do so, corresponding alarm relays will activate as well as NAC circuit outputs and auxiliary outputs.

**6-1.7** If repeaters NACs are programmed, the control unit shall send commands to those repeaters for activation.

**6-1.8** If used for Sprinkler Supervisory, the Supervisory LED shall flash once a second accompanied by an audible pulse. A dedicated relay assigned specifically for a Sprinkler Supervisory Alarm will be activated.

**6-1.9** Upon receipt of a Trouble condition, the trouble LED shall flash once a second accompanied by an audible pulse once every 10 seconds.

**6-1.10** If multiple alarm reporting occurs, the highest priority alarm condition will take priority over lower priority conditions. The lower priority conditions can be redisplayed only when the highest priority alarm has been acknowledged.

## **7. ALARM HISTORY RECALL**

**7-1** The panel shall be able to recall the last 1000 Alarm, Supervisory and Trouble Signals, as well as Test and Event Logs.

## **8. TRANSMITTER SIGNAL VERIFICATION**

**8-1** Within 200 seconds the panel shall automatically review all test transmissions received from all initiating devices and repeaters in the installation.

If the Control Unit fails to receive a test transmission from

any initiating device or repeater within a 200 second period, a trouble condition indicating a test failure will be displayed.

## **9. CONTROL UNIT TEST MODE**

**9-1** The Control Unit shall provide for a test function to allow for testing all protection devices without activating NAC's or relay outputs.

## **10. Warranty**

**10-1** The manufacturer of the control unit, repeaters, and initiating devices will provide Owner with a limited warranty on all equipment manufactured by it.

## **11. CONTRACTOR CERTIFICATE**

**11-1** Upon completion of the installation, the Contractor shall provide to the engineer, local authority having jurisdiction, and or owner; a record of completion.

## **12. OWNER MANUALS**

**12-1** Contractor shall provide the Owner three (3) complete manufacturer's Owners Manuals on the completed system; to include operating and maintenance instructions and catalog cuts of all equipment and components as well as built drawings.

## **13. TRAINING SESSION FOR OWNER**

**13-1** Contractor shall provide a thorough training session for the Owner's selected personnel regarding the system operation and maintenance program prior to final acceptance.

## **14. CONTRACTOR WARRANTY SERVICE**

**14-1** The contractor shall maintain a service organization capable of responding to the job for warranty work on a maximum twenty-four hour response basis.

## **15. INSTALLATION REQUIREMENTS**

**15-1** Documents and Approvals

**15-1.2** Contractor shall provide Owner with a list of exceptions, variances, and substitutions listed at the time of bid.

**15-1.3** Installation plans shall be submitted to the local authority having jurisdiction for written approval prior to commencing any work.

**15-1.4** Refer to General Conditions, Electrical General Conditions and Special Conditions for further requirements.

## **16. CONTRACTOR QUALIFICATIONS**

### **Licenses**

**16-1** Contractor shall be a licensed fire alarm installer as required by the local authority.

### **Contractor Personnel**

**16-1.2** Contractor shall provide manufacturer trained personnel to perform the installation and/or have a factory trained manufacturer's representative supervise the installation.

## **17. INSTALLATION**

**17-1** The entire system shall be installed in a workmanship like manner, in accordance with manufacturer's installation guidelines and all applicable codes.

## **18. SYSTEM TESTS**

**18-1** Contractor shall perform system performance tests, as set forth in the Manufacturer's Installation Manual, regarding the installation of each protection device and other components in the system prior to the final acceptance test.

**18-1.2** Upon completion of the installation and prior to turning the system over to the Owner, Contractor shall request inspection and certification approval of the installation by the local authority having jurisdiction.

## **19. SYSTEM SPARE PARTS**

**19-1** Contractor shall not substitute any transmitting device, component, spare part, or other equipment in the installation other than that specified by the manufacturer, unless approved by the manufacturer.

## **20. TESTING & MAINTENANCE**

**20-1** The system shall be tested and maintained in accordance with NFPA Chapter 10 2007 Edition and NFPA Chapter 14 2010 Edition.