

**SECTION 16745****TV/SAT & VIDEO SYSTEMS****PART 1 GENERAL****1.01 SUMMARY**

The work under this section shall consist of providing a complete and fully operational central antenna television, satellite and associated video and radio systems, including cable distribution scheme as shown on the plans.

A complete system shall be provided where shown on the plans.

The systems as described herein shall support the distribution of broadband signals.

**1.02 SUBSTITUTION OF MATERIALS**

Equipment as listed herein is considered approved for bidding on this project. Where specific makes and models are referred to, the intention is to establish a minimum level of performance and features. Equipment of another manufacturer may be substituted provided it is suitable for the application and meets or exceeds the specified performance in all areas. Approval of proposal alternate equipment shall be subject to review and approval by the engineer.

**1.03 vendor qualifications**

The installation contractor shall have a minimum of 3 years experience in the installation and servicing of video broadband systems.

If so requested, the Contractor shall provide 3 references of projects of comparable size and scope that have been completed within the last 2 years. The references shall include: project name, address, date of substantial completion, and name and telephone number of manager of the system.

If so requested, the Contractor shall provide letters verifying that the contractor is a factory authorized distributor or dealer of the specified products. Letters shall be on manufacturers letterhead or letterhead of approved factory representatives.

**1.04 SUBMITTALS**

Material list showing quantity, manufacturer and description of each item being furnished.

Functional block diagram of the system showing all equipment and connections.

Equipment rack layout.

Physical and schematic drawings of special and custom components or hardware. Any special installation requirements shall be listed. Include panel layouts.

Drawings of television monitor mounting details.

Catalog sheets with complete technical data for each item being furnished.

## **1.05 REFERENCES**

All Work shall comply with:

The standards and practices of the Cable Access Television and Closed Circuit Television Industries.

National Electric Code.

Equipment manufacturer's recommended installation requirements and methods.

## **1.06 QUALITY ASSURANCE**

Attention is directed to provisions of the GENERAL TERMS AND CONDITIONS AND SPECIAL CONDITIONS regarding guarantees and warranties for work under this Contract.

Manufacturers shall provide their standard guarantees for work under this section. However, such guarantees shall be in addition to and not in lieu of all other liabilities which manufacturers and contractors may have law or by other provisions of the Contract Documents.

The system shall be installed to meet the minimum requirements of the following:

The operating bandwidth of all passive devices shall be from 5MHz to 1GHz.

The operating bandwidth of all active devices shall be from 5MHz to 750MHz.

The system shall be designed for -57dB cross-modulation or better and a carrier to noise ratio of at least 55dB.

System radiation shall not exceed the following limits:

5MHz to 54MHz: 15 microvolts per meter at 100 feet.

54MHz to 216MHz: 20 microvolts per meter at 10 feet.

216MHz to 550MHz: 15 microvolts per meter at 100 feet.

Isolation between any passive device in the system shall be a minimum of 30dB for any frequency between 5MHz and 1GHz.

## **PART 2 –PRODUCTS**

### **2.01 BASIC UNIT FOR CASCADABLE MULTISWITCH**

Basic unit with cascadable multiswitch system with 4 SAT-IF sockets, 1 terr. Input and 4 outlets, frequency range 40-2200MHz.

### **2.02 ASCADABLE MULTISWITCH**

Cascadable multiswitch, 4 SAT-IF sockets (terr. Signals integrated), 4 x through, 4 x tap to the receivers, frequency range 40-2200MHz.

**2.03 VHF AMPLIFIER**

a- Bandwidth	47-470 MHz
b- Gain	36 dB
c- Output level	120 dB
d- Band Gain adjustment	15 dB
e- Noise figure	7 dB
f- Power supply	12 Vdc

**2.04 UHF AMPLIFIER**

One- Bandwidth	470-860 MHz
Two- Gain	40 dB
Three- Output level	128 dB
Four- Band Gain adjustment	15 dB
Five- Noise figure	7
Six- Power supply	12 Vdc

**2.05 VHF ANTENNA**

One- Number of elements	>10
Two- Gain	>11 dB
Three- CH5-CH12	
Four- Aperture Angle	40-50 degree
Five- Front/rear ratio	18-22
Six- Impedance	75 ohm

**2.06 UHF ANTENNA**

One- Number of elements	22
Two- Gain	15-17 dB
Three- Aperture angle	20 degree
Four- Front/rear ratio	>15
Five- Impedance	75 ohm

**1.07 RECEIVER**

Stereo-SAT-receiver for TV- and radio-SAT-reception, input frequency 950-2150 MHz.

**2.08 WALL OUTLET**

Triple SAT-wall outlet for stub lines in distribution networks, frequency range 40-2400 MHz, DC path, 2 dB tap loss.

**2.09 RECEPTION EQUIPMENT**

The system shall include an antenna system for the reception of the Jordan Television channels (Arabic and English), Israel (Arabic & English) and Syria (Arabic & English). The antenna system shall consist of high gain Yagi antenna in the B III frequency band, as shown on the drawings.

The system shall also include a satellite dish antenna systems for the reception of ARABSAT I, and EUTELSAT Hot Bird position 13 deg. east.. Each antenna system shall consist of a steerable 1.8 meter diameter dish with all electronics and accessories required for a complete system as shown on the drawings.

The system shall include an antenna for the reception of Jordan Radio Broadcast in the VHF FM band 87.5 to 108Mhz.

All antennas shall be connected to suitable mast head amplifier by low loss 75 ohm coaxial cable.

The system shall include mast head amplifiers to cover the frequencies used by Jordan Television in the B III (174-230mhz). The preamplifiers shall have the necessary gain for the system requirements. The preamplifier shall be mounted in weatherproof housings. The output impedance shall be 75 ohm with power being fed from the Central Facilities headend via coaxial cable feed.

The system shall include low noise FM mast head amplifier suitable for the FM radio broadcast band of 87.5 to 108mhz having sufficient gain for the location of the site. The output impedance shall be 75 ohm and power shall be fed via coaxial cable feed from the Central Facilities headend.

The system shall include power inserter/galvanic isolator with frequency range 60 – 230 MHz to act as a connection point for power for the mast head preamplifiers.

The system shall include accessories such as antenna coupling filters and wide band coaxial splitters as may be required.

The system shall include power supplies for the mast head preamplifiers with input of 127V or 220V, 60 Hz and output to suit the amplifiers.

The system shall include antenna mounting masts. The masts shall be of sufficient height to give good signal reception to the antennas mounted on it. The masts shall be of aluminum self supporting circular section complete with all bracings and accessories to support of the antennas and shall stand a wind velocity of 160 kph.

## **PART 3 EXECUTION**

### **3.01 PLACEMENT**

All equipment must be located in the vicinity indicated on the drawings and placed in accordance with the manufacturer's recommendations.

### **3.02 WIRING**

#### **Installation:**

All wiring shall be installed in conduit. However, at the option of the Contractor, U.L. listed insulated cable for plenum application may be used in cable tray.

#### **Protection:**

All wiring shall be protected as required by the National Electrical Code.

**Point-to-Point Wiring.** All wiring within the system shall be point-to-point with appropriate terminal connections for every wire and component termination. All wires shall be tagged at all junction points, and shall test free from grounds or crosses between conductors. Routing of cabling shall be as indicated. All cable and wire shall be the type recommended by the equipment manufacturer, and shall bear the manufacturer's trademark either embossed or printed on the cable. The Contractor is responsible for system performance, and, if the wire and cable selected for system proves inadequate for performance specified, he shall replace the wire and cable with adequate cable at no cost to the Employer. A wiring schematic for each system shall be submitted for review by the Engineer before installation is begun.

### **3.03 TESTING**

Upon completion of the installation, the system must be tested by the manufacturer's representative and all necessary modifications and/or adjustments must be made to assure compliance with this specification. Each outlet shall have a signal strength 65-75 dBu and shall be tested by using Spectrum Analyzer.

### **3.04 CERTIFICATION**

Upon completion of the testing, the manufacturer or his representative shall issue to the Employer a letter of certification attesting to the fact that he has tested and adjusted the system, that all components are properly installed and free of defects, and that the system is in compliance with this specification.

### **3.05 GUARANTEE**

All work, materials, supplies, and equipment necessary to make the system ready for continuous and satisfactory service shall be guaranteed for a period of 1 year from date of final certification of completion. This guarantee shall include on the premises maintenance at no cost to the Employer during the guarantee period. The service on equipment shall be performed by local factory-trained, full-time employees of the manufacturer's organization. Service shall be provided on a 24-hour emergency basis.

**3.06 INSTRUCTION**

The work shall include supplying the services of a field service representative who shall be a full-time employee of the manufacturer. The field service representative shall have specialized experience in the operation and maintenance of the system, and shall instruct the Employer's personnel in the techniques involved in the operation of the systems. These services shall be for a 1-day period minimum.

**END OF SECTION**

**SECTION 16746****AV / VIDEO/DATA PROJECTION AND CONTROL SYSTEMS****1. CONFERENCE HALL****A. VIDEO/DATA PROJECTOR**

The conference hall video/data projector shall be of the LCD type, shall be mounted to the ceiling and shall exhibit the following minimum features:

- a. A minimum of 1000 ANSI lumen light output
- b. A minimum native resolution of 800X600 pixels
- c. Must include a pixel map processor to convert 1024X768 incoming signals to the full resolution of the LCD panels
- d. Must incorporate true colour reproduction video processing to produce very sharp and stable images and offer dynamic colour depth correction
- e. No convergence adjustments shall be required
- g. Motorized zoom, focus and lens shift (horizontal and vertical)
- h. Automatic source recognition and priority switching
- j. Shall be compatible with :
  1. All current video sources (PAL, SECAM, NTSC3.58, NTSC4.43) in composite, S-VHS, RGB or component forms
  2. All computer graphics formats from VGA, S-VGA, XGA
  3. Electronic workstations with a resolution up to 800X600 pixels
- k. Shall include the following inputs:
  1. RGBHV
  2. Composite video
  3. S-video

**B. PROJECTOR AND VIDEO/DATA/AUDIO SWITCHER**

The switcher shall exhibit the following minimum features:

- a. Shall have a minimum bandwidth of 200MHz to guarantee switching of the highest resolution graphics signals without any signal loss or image degradation
- b. Shall be equipped with the following:
  - 1- AV 8X1 RGBHV inputs/outputs.
- c. Shall have the ability to be controlled from an external computer (RS232).
- f. Shall be controlled via its front panel.

### **C. VGA INTERFACE**

The VGA interface shall enable the connection of any IBM or compatible desktop or portable computer to a projector whilst maintaining the connection with the computer's own display and shall be able to buffer and amplify any RGB analog signal without any signal loss or image degradation. The VGA interface shall exhibit the following minimum features:

- a. Shall have a minimum bandwidth of 200mhz
- b. Shall have automatic detection of sync polarity, separate sync or sync on green
- c. Shall be compatible with all computers with RGB and H&V sync
- d. Shall have an audio-stereo interface.

### **D. MOTORIZED PROJECTION SCREEN**

The motorized projection screen shall have the following minimum features:

- a. Shall have a minimum dimensions of 183 X 244 cm
- b. Shall be electrically operated
- c. Shall include a quick reversal, ball bearing type oiled for life motor with automatic thermal overload cutout and integral interlocking gears
- d. Must have preset and adjustable limit switches to automatically stop screen fabric in the "up" and "down" positions
- e. The screen surface shall be made of a flame retardant and mildew resistant matt white fabric with black masking borders
- f. The screen case shall be finished with a primer coat to be ready to accept final finish
- g. Shall be supplied with mounting brackets for mounting screen to ceiling or wall
- h. Shall be supplied with a low voltage control system

### **E. VIDEO RECORDER**

Hi Fi stereo Video recorder.  
SVHS video system  
4 + 2 + 1 head drive.  
Comb filter for best picture quality

### **F. MICROPHONES**

Gooseneck Microphone that shall be fixed in table Shock mounts Mic, Cardioid,  
Dynamic range 94 dB.  
50-17000Hz. Output impedance rated at 150 ohm.



**Wireless Microphones**

They shall be used by the Audience.

VHF wireless Mic system, the Microphone shall be of a Cardioid (unidirectional) dynamic type.

The system shall have a VHF receiver with a Noise squelch circuitry and a Diversity system.

It shall be of electret type with anti-noise suspension & feature the following:

- Carrier Frequency            170-240 MHz, 13 standard frequencies as a min.
- Modulation                    FM
- Frequency Stability            + /- 10 KHz
- Frequency Response          40 Hz-18 KHz
- Max. Sound Pressure          100 dB SPL
- Signal to Noise Ratio          > 100dB (A)

**WIRELESS LAVIER MICROPHONE**

Used by the presenter super Cardioid condenser Mic. with a tie clip. A VHF body pack transmitter and a Diversity VHF receiver 20-20000 Hz.

Output impedance rated at 150 ohm. The sensitivity shall be 6 mV/Pa

**G. AUTOMATIC MICROPHONE MIXER**

Digital logic Auto mixer shall be of the automatic 8-channel type and shall exhibit the following minimum features:

1. Level, tone & HPF control on eight channels and aux input.
2. Auto mixing and out put assign selectable on each channel.
3. Main output leveler, plus compression on each channel.
4. Remote control, logic output & linking of multiple units.

**H. PAGING DESK**

It shall feature the following:

- Frequency Response          100 Hz-12 KHz
- Directivity                    Unidirectional-Cardioid
- Sensitivity                    1.4 mV/Pa
- Signal to Noise Ratio          > 40dB / 1micro bar
- Load Impedance            > 2 Kohm
- Output Impedance            500 Ohm-balanced



**SECTION 16747****CONFERENCE SYSTEM****PART 1 –GENERAL****1.01 SUMMARY**

- A. The scope of this work shall include a complete conference system.
- B. The system shall be tested, fully operational and documented to the Employer.
- C. The conference system shall be installed in the conference room.

**1.02 SYSTEM DESCRIPTION**

- A. The conference system shall enable participants to speak, register a request to speak, and listen to the speaker.
- B. The delegate unit shall accommodate two separate headphones , so the speaker can be heard clearly even in situations with excessive background noise. The delegate unit shall have a built-in loudspeaker which is muted when the microphone is on to prevent acoustic feedback.
- C. The chairman unit shall have a microphone priority button which, when pressed, causes all currently active delegate microphones to be permanently or temporary switched off, thus allowing the chairman to take control of the meeting.
- D. The system shall be interfaced with the sound system rack allocated to the conference room, where audio taping may take place.

**PART TWO –PRODUCTS****2.01 SYSTEM COMPONENTS:**

- A. Delegate Discussion Unit shall consist of:
  - Microphone with light-ring indicator.
  - Loudspeaker, automatically muted when microphone is on and/or headphones are connected.
  - Microphone on/off button.
  - Microphone on/request-to-speak bi-color LED indicator (red-mic. On, green request to speak).
  - 6-pole circular socket for loop-through connection to other system units.
  - Jack plug socket for headphone connection.
  - Rotary volume control for headphones.

- Recessed microswitch for resetting the units address.
- B. Chairman Discussion Unit shall consist of:
- Chairman priority button.
  - Microphone with light-ring indicator.
  - Loudspeaker, automatically muted when microphone is on and/or headphones are connected.
  - Microphone on/off button.
  - Microphone on LED indicator (red).
  - 6-pole circular socket for loop-through connection to other system units.
  - Jack plug socket for headphone connection.
  - Rotary volume control for headphones.
  - Recessed microswitch for resetting the units address.
- C. Central Control Unit shall feature the following:
- conference control without operator.
  - Controls up to 60 contribution units.
  - Facilities for microphone management, voting and simultaneous interpretation.
  - Built-in audio equalizer for delegate and chairman loudspeakers.
  - Built-in power supply unit to supply both the CCU and all externally connected equipment.
  - Control facilities for unlimited number of distribution units such as audio media interface units, data distribution boards and etc..
  - Control and processing facilities for ten 64 kByte data channel.
  - Basic microphone management facilities for a wide variety of conference situations.
  - Three operational modes are available: OPEN, OVERRIDE, VOICE.
  - Each mode of operation allows the selection of one, two or four delegates microphones to be activated simultaneously.
  - Rotary loudspeaker volume control.
- D. Audio Receiver Unit shall feature the following:
- one balanced audio output for an amplifier for the common zones.
  - One unbalanced audio output for a cassette recorder.
  - A monitor speaker with respective volume control knob.
  - A socket for headphones that can be used as an alternative to the monitor speaker.
  - A volume control for adjusting the level of the signal sent to the speakers on the microphone stands.
  - A LED VU-meter for checking the volume level.
  - One input for a cassette recorder.
- E. Adder Unit shall feature the following:
- supplies microphones stands and enables the system to reach maximum capacity.

- The receiver shall accommodate seven language channels.
- Shall include an upshift channel selection facility that eliminates interference from HF fluorescent lamps.
- Each receiver shall have a rechargeable battery.
- Shall have headphone socket for accessing to the appropriate channel.

#### D. High Quality Dynamic Headphones

- Shall offer high-quality sound reproduction.
- Shall have the following as a minimum:
 

Impedance	360 ohm
Frequency response	250 Hz to 13 kHz (-10dB)
Power handling capacity	200 mW
Sensitivity (1 kHz)	97 dB SPL/earpiece at 0 dBV/system    96 dB SPL/ earpiece at 1mW/system

#### E. Interpreter desk

- shall conform to international standards.
- shall be a microprocessor controlled unit (A-B type) and shall accommodate up to 7 language channel.
- Shall have an LCD screen to show the selected language and other related information.
- Shall have a condenser microphone with built-in pop- and windshield complete with light ring.
- Built-in loudspeaker with volume control for distribution of the floor language when all microphones in the booth are switched off.
- Headphone, volume, treble and bass controls.
- Rotary selection switch for quick selection of the incoming language channel.
- Outgoing A-channel and B-channel select key with channel select indicator.
- Outgoing B-channel selection keys (up/down).
- 'channel engaged' indicators for both A and B outputs.
- LCD shall show the following:
  - incoming channel languages
  - incoming language quality indication
  - outgoing languages
  - messages
- multi-lingual programming instructions when in installation mode.
- each interpreter shall two headphones and shall be as follow:

Impedance	2 X 720 ohm
Frequency response	250 Hz to 13 kHz (-10 dB)
Power handling capacity	200 mW
Sensitivity	97 dB SPL/earpiece at 0 dBV/system 96 dB SPL/earpiece at 1 mW/earpiece

**0.03 customer instruction**

- A. Provide a minimum of four hours of on-site in-service training in the operation of the conference and simultaneous systems. The training shall be provided by a training specialist specifically schooled in the operation, programming and features of the installed training may be divided into multiple times as required by the Employer. The hours shall be documented by the Contractor to verify that specified training has been provided to the Employer. If the hours are not documented, the Contractor shall provide additional training to the specified hours.

**END OF SECTION**

**SECTION 16748****SIMULTANEOUS TRANSLATION SYSTEM****PART 1 GENERAL****1.01 SUMMARY**

- A. The scope of this work shall include a complete simultaneous translation system.
- B. The simultaneous translation system shall be tested, fully operational and documented to the Employer.
- C. The simultaneous translation system shall be installed in the conference hall.

**1.02 SYSTEM DESCRIPTION**

- A. An infra-red system shall be used to provide wireless communication between the attendant and the interpreter.
- B. Unlimited number of delegates shall receive the infra-red signals clearly.
- C. The system shall consist of an infra-red transmitter, several radiators and individual infra-red receivers for delegates.
- D. Each infra-red language distribution system shall be assembled separately to ensure correct radiation intensity and subsequently a sufficient signal-to-noise ratio to provide clear reception in the conference hall.

**PART 2 –PRODUCTS****2.01 SYSTEM COMPONENTS:****A. Transmitters**

- Shall generate a carrier wave for each language channel.

**B. Radiators**

- Shall distribute the infra-red signals throughout the conference hall.
- The contractor shall decide the number of radiators required to cover the conference hall.

**C. Receivers**

- Shall have a good sound quality and high volume for enhanced speech intelligibility.
- Shall have a circuitry that automatically switches off the receiver if the user has left the infra-red reception zone for a preset period of time.

## **PART 3 - EXECUTION**

### **3.1 Installation**

- A. All equipment shall be installed in a professional manner.
- B. Cabling shall be neatly routed and bundled along the equipment . Cabling shall not hang.
- C. Cable connectors shall be the mating connector to the terminal on the equipment. Adapters will not be accepted to interface a cable connector to the equipment jack.
- D. Installer shall follow factory installation guidelines for pulling tension and bending radius.
- E. Cables shall be one continuous piece between each system device.
- F. Dress cables routed to equipment with sufficient slack to allow for service of equipment and avoid strain on connections or cable.
- G. All wiring shall be installed in conduit. However, at the option of the contractor, UL listed insulated cable may be installed All equipment power and signal wiring shall conform to the National Electrical Code and to applicable local codes.
- H. All equipment and devices shall be securely mounted. No device shall be supported by its wires or cables.
- I. Terminate each cable to terminal blocks in sequence, including grounding drain wires.
- J. Terminal locations and cables shall be labeled, legibly, with permanent embossed labels or by labeling pen. Identification shall be labeled on As-built Drawings.

### **0.01 system tests and programming**

- A. All system functions shall be tested for proper performance. All test results shall be documented for inclusion in the as-built manuals.
- B. The Contractor shall provide complete system programming in coordination with the Employer. The programming shall be done by a person that has received factory training in the programming of the installed system. Any programming not coordinated with the Employer that the Employer wishes to have changed shall be done at no charge to the Employer.



**F. Charging case**

- shall accommodate the number of all receivers batteries at one time.

**PART 3 – EXECUTION****3.01 Installation**

- A. All equipment shall be installed in a professional manner.
- B. Cabling shall be neatly routed and bundled along the equipment . Cable connectors shall be the mating connector to the terminal on the equipment. Adapters will not be accepted to interface a cable connector to the equipment jack.
- C. Installer shall follow factory installation guidelines for pulling tension and bending radius.
- D. Cables shall be one continuous piece between each system device.
- E. Dress cables routed to equipment with sufficient slack to allow for service of equipment and avoid strain on connections or cable.
- F. All wiring shall be installed in conduit. However, at the option of the contractor, UL listed insulated cable may be installed All equipment power and signal wiring shall conform to the National Electrical Code and to applicable local codes.
- G. All equipment and devices shall be securely mounted . No device shall be supported by its wires or cables.
- H. Terminate each cable to terminal blocks in sequence, including grounding drain wires.

**3.01 System tests and programming**

- A. All system functions shall be tested for proper performance. All test results shall be documented for inclusion in the as-built manuals.
- B. The Contractor shall provide complete system programming in coordination with the Engineer. The programming shall be done by a person that has received factory training in the programming of the installed system. Any programming not coordinated with the Engineer that the Engineer wishes to have changed shall be done at no charge to the Employer.

**3.03 Customer instruction**

- A. Provide a minimum of four hours of on-site in-service training in the operation of the simultaneous translation system. The training shall be provided by a training specialist specifically schooled in the operation, programming and features of the installed training may be divided into multiple times as required by the Engineer. The hours shall be documented by the Contractor to verify that specified training has been provided to the Employer. If the hours are not documented, the Contractor shall provide additional training to the specified hours.

**END OF SECTION**

## **SECTION 16750**

### **SECURITY SYSTEM**

#### **PART 1 GENERAL**

##### **1.01 SUMMARY**

- A. Section includes: Provide on operational main security panel, infra-red detectors and slave key pad.
- B. Related Work: Work of the contract includes cabling and termination. All work area is cabled according to EIA/TIA 568A with 2, 3 and 4 pair Category 5 unshielded twisted pair (UTP) cable.
- C. 1.02 vendor qualifications
- D. The contractor of the security system must have been in business a minimum of 10 years in the installation and service security systems.
- E. The contractor shall provide references of the last 2 networked projects of comparable size and complexity for the manufacturer's equipment bid which have been completed before the date of bid for this project. The references shall include the project name, address, and name, title or (position) and telephone number of manager of the system.

##### **1.03 SUBMITTALS**

- A. General Requirements: Contractor shall furnish a set of illustrations, specifications and engineering data sheets of the equipment items proposed under these Specifications.

##### **1.04 MAINTENANCE MANUAL**

- A. General Requirements: Maintenance Manual shall be turned over to the Employer, including operating and maintenance instructions, replacement parts lists and wiring diagrams. Such manuals shall be submitted for security equipment and bound into ring binders on GBC type comb back binders.

##### **1.05 DESCRIPTION OF SECURITY SYSTEM**

- I. Provide a complete and operating security system suitable for per plans and specifications.
- II. The security panel shall be microprocessor based.
  - 1- The system shall have facilities for at least 5 zones.
  - 2- The system shall have indication of all types of alarm.
  - 3- Programming shall be onboard keypad.
  - 4- It shall have 13 event alarm memory.
  - 5- Any zone can be omitted.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Only one manufacturer's brand of telephone equipment shall be used throughout the network.

### **2.02 EQUIPMENT**

#### **SECURITY CONTROL PANEL**

- A. Definitions: The system provided including but not limited to equipment, hardware, wiring, ... etc. must have the minimum capacities as shown on the plans and described in specifications.
- B. Provide the required security system for this facility. The system shall be a digital type system as described in this specifications. Refer to the plans for the minimum required equipment.
- C. It shall feature the following:
- Back up batteries.
  - Loop response time 300 mseconds
  - Max loop resistance 2K
  - Exit time 2-90 Seconds
  - Entry time 2-90 Seconds
  - Bell cut off time programmable 1-98 Min

### **2.03 SECURITY KEY PAD**

- A. Shall feature the following :
- 2 X 16 character backlit LCD display.
  - All data is entered via a 12 key keypad
  - The keypad is connected to the main security panel.
  - Shall have audible warnings.

### **2.04 INFRA-RED DETECTORS**

- A. The infra-red detector shall feature the following:
- range nominal shall be 15m as a min.
  - coverage angle shall be 110 deg. As a min.
  - infra-red type
  - operation temp. is -10c to +50c deg.
  - RFI protection shall be 20v / m to 1000MHz

- Alarm period shall be 1 sec. + / - 20%
- Max. ripple shall be 4V dc as a min.

## **2.05 EXTERNAL SOUNDER**

It shall feature the following:

- water proof enclosure.
- Sound output is 118dB @ 1m.
- Self-activating.
- Backup rechargeable battery is built in.
- Cutoff time is 18 mins.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Demonstrations: The contractor shall provide a demonstration of operation of the security system within 14 days of award of contract. The demonstration shall include features and operation of the security equipment.
- B. Installer Qualification: Installation shall be by a factory certified vendor/installation contractor of the equipment to be installed. Bidder shall furnish, with the shop drawings, certification documents showing factory authorized training record of installation personnel.
- C. Installation: All equipment shall be installed in a clean professional manner
  - 1- Mounted equipment shall be vertically plumb and fastened securely with appropriate hardware for the application.
  - 2- Pertaining cable terminations, the pair twist shall continue as close as possible to the termination point.
  - 3- Pertaining to panels installation, blocks shall be vertically plumb and securely fastened to the back boards. Station and riser cables shall be routed in D-rings, brackets, and troughs and be securely fastened to prevent strain at the terminations.
  - 4- Cables routed to slave equipment located on the floor shall be harnessed and neatly dressed with enough slack to allow equipment movement as necessary for installation and service.
- D. Labeling: Terminal blocks shall be labeled legibly with permanent embossed labels or by labeling pen.

### **3.02 GROUNDING**

- A. Riser cable shields, equipment frames and cabinets shall be grounded with 10mm<sup>2</sup> connected to the nearest building ground location. Grounding shall be in accordance with NEC and Local Codes.
- B. All equipment shall be grounded per manufacturers recommendations and in accordance with NEC and Local Codes.

### **3.03 TESTING**

- A. System shall be tested for all functions of operation .
- B. Perform all equipment tests as directed by the equipment manufacturers. Submit results of tests with as-built documents.

### **304 CUSTOMER TRAINING**

- A. A vendor shall provide in service training to owner selected staff
  - 1- Provide on site training for console operators and any other owner selected staff. Training services shall be furnished to the owner as required for the entire warranty period as defined in paragraph 3.05 of this specification.

### **305 WARRANTY AND SERVICE**

- A. Warranty shall be for one full year from the successful commissioning work as follows:
  - 1- Service Response Times: Contractor shall perform corrective work as follows:
    - i. Three hour response time after receiving the request for service call.
  - 2- Repair parts: repair parts shall be available on-site within 8 hours after receiving the request for service call for any system equipment.

**END OF SECTION**