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## AUDIO-VIDEO SYSTEMS

### PART 1: GENERAL

#### 1.1 Introduction

Zimmer Development's Oasis Apartments is a market-rate garden style project consisting of 3 buildings and 204 units.

InfiniSys has been contracted to coordinate the overall design and cabling for Audio-Video Systems for the project on behalf of Zimmer Development.

#### 1.2 Copyright

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#### 1.3 Information for Bidders

It is the intent of the A/V design that the A/V cabling and speakers specified in the InfiniSys drawings set be supplied, installed, and terminated by the low voltage contractor. This cabling is in addition to the phone, video, and data cabling already specified. The A/V contractor will be responsible for supplying and installing all electronics, including source equipment and any Ethernet switches required, patching, any connections required, and final system programming.

The installing contractor is responsible for procuring specified materials, installing wiring and testing all components as described in this document, the accompanying drawing set, and the bill of materials. The installing contractor shall also schedule all work to meet the overall project schedule.

All materials necessary for proper installation, such as special tools, fasteners, fire caulking and other materials not specifically mentioned are the responsibility of the installing contractor. The installing contractor is responsible for secure storage of materials on site.

#### 1.4 Codes, Regulations, and Standards

All work will meet or exceed the requirements of all applicable statutes, ordinances, rules, codes, regulations, decisions, and orders of all local, state, and federal authorities having jurisdiction over the construction of telecommunications cable systems, including, but not limited to, applicable building codes, fire codes, and regulations of the Occupational Safety and Health Administration and Federal Communications Commission.

All work will meet or exceed the requirements of the 2020 National Electrical Code, other NFPA codes, and any then-current amendments or addenda thereto, including, but not limited to:

NFPA 70 National Electrical Code 2020 Edition, Article 800

"Communications Systems"

NFPA 70 National Electrical Code 2020 Edition, Article 200

"Wiring and Protection"

Except as otherwise specified in the Scope of Work, all work will meet or exceed the requirements of the ANSI/TIA telecommunications cabling standards and any then-current amendments or addenda thereto, including, but not limited to:

ANSI/TIA-570-D

"Residential Telecommunications Infrastructure Standard"

ANSI/TIA-568.0-D and addenda

"Generic Telecommunications Cabling For Customer Premises"

ANSI/TIA-568.1-D and addenda

"Commercial Building Telecommunications Cabling Standard"

ANSI/TIA-568.2-D and addenda

"Balanced Twisted-Pair Telecommunications Cabling and Components Standards"

ANSI/TIA-568.3-D and addenda

"Optical Fiber Cabling Components Standard"

ANSI/TIA-568.4-D and addenda

"Broadband Coaxial Cabling and Components Standard"

ANSI/TIA-569-E and addenda

"Telecommunications Pathways and Spaces"

ANSI/TIA-606-C and addenda

"Administration Standard for Commercial Telecommunications Infrastructure"

ANSI/TIA-607-C and addenda

" Generic Telecommunications Bonding and Grounding (Earthing) For Customer Premises"

All work will meet or exceed the safety requirements and certifications of Underwriters Laboratories Inc. (UL).

Except as otherwise specified in the Scope of Work, all video cabling will be installed and terminated in accordance with Society of Cable Telecommunications Engineers standards.

## PART 2: PRODUCTS

### 2.1 Cable and Components

All Speaker cabling shall be 2 or 4 conductor 16 gauge (or larger) UL Class 3. The outdoor speaker zone and some internal zones will require 14-gauge UL Class 3 cable or larger, depending upon actual distance of the run and whether a 70 volt zone is used. The installing contractor is responsible for measuring the length of the speaker cable runs and sizing the wire appropriately.

All Cat-6 cables shall be at a minimum riser rated and plenum rated in such spaces that require it by local, state or national code. The plenum rating must conform to the most current version of NFPA 262. Shielded Cat-6 cable is required where specified in the drawings.

All interconnect wiring that utilizes 4-Pair TIA Cat-6 twisted pair copper cable shall be terminated utilizing the TIA 568a standard configuration.

A single or dual-gang low-voltage mounting ring shall be installed during rough-in for each outlet. If the outlet is in a fire-rated wall, then appropriate electrical boxes must be used.

Items that are not specifically shown on the drawings or called for by the scope of work, but are required by local, state and federal authorities or normally used and required for the system design to perform to specifications and system design intent, will be considered part of the scope of work.

### 2.2 Televisions

All televisions shall be high definition, 4k UHD smart TVs. Where Televisions are to be wall mounted, blocking must be provided.

In areas where settop boxes are required, the boxes shall be remotely rack mounted at the A/V headend location in the Clubhouse A/V Closet and HDBaseT or HDMI/IR extenders run to the TV locations.

Designated televisions will require control of the volume, input, and channel using the stand-alone in-wall controllers such as the Extron MCC62RSD or equivalent.

### 2.3 Speakers

All interior speakers shall be 8" round in-ceiling mount, with paintable grills. In double volume areas, in-wall speakers may be used. If the ceiling or wall is a fire rated structure, fire rated back boxes must be used.

Outdoor speakers should be chosen for the space they will reside. Rock speakers or landscape lighting style speakers shall be used when there are sufficient landscaped areas or planters to hide the speakers. Surface mount speakers shall be used when mounting to structures.

## 2.4 Audio Control System

The submitted audio control system must provide for control of any audio zones by leasing office located touch panel and mobile device, such as an iPad. We recommend the use of Russound MCA-88X zone controllers (or equivalent) with the associated Russound multi-channel amplifiers (or equivalent) and an external 70-volt amplifier such as the Crown Audio amplifiers (or equivalent).

All touch panels, speakers, and control hardware must be hard-wired back to the A/V headend. No wireless connections beyond what is required for the staff tablet are to be used.

All audio zones will require control of the source and volume, with preset volume limits programmed in.

## 2.5 Source Equipment

### A. Audio

Because of user interaction required at certain intervals to maintain the stream, streaming audio sources shall require programming to ensure the audio plays continuously.

Recommended audio sources are Sirius XM commercial accounts. The number of tuners and accounts shall be determined by the number of zones requiring unique programming at the same time. A minimum of three is required.

At Zimmer Development's discretion, Cable Company commercial music accounts may also be used, but it must be verified that metadata (Station/Genre/Song) is transmitted to the control system for display at the touch panels. If metadata is not transmitted, it is the responsibility of the A/V Contractor to program the stations/genres into the system for display at the touch panels.

The audio controller or matrix switcher must be sized according to the number of audio inputs required, which is a minimum of two, but may be increased by management.

### B. Video

Settop boxes should be remotely rack mounted at the A/V headend location in the A/V closet and HDMI extenders or HDBaseT run to the TV locations from either the settop boxes or from a video matrix switcher.

## PART 3: EXECUTION

### 3.1 Cabling Practices

The installing contractor may use bundled, webbed, or jacketed hybrid cable assemblies as long as the component cables and any outer jackets or sheaths of the assembly meet the above requirements. All low-voltage wiring shall be run at least one stud bay apart (12" minimum) from any parallel high-voltage wiring, and cross at right angles whenever necessary. Where there is insufficient clearance to meet that requirement, the cabling must be arranged in accordance with the "Cabling Practices" drawing in the InfiniSys drawing set to provide the maximum possible separation. Under no circumstances shall the lateral distance be less than 4" without supplemental shielding. The only exception is where cables cross at right angles, where a 2" minimum separation must be maintained.

Protecting cabling from damage is the responsibility of the installing contractor. All cabling must be run where it is unlikely to be damaged. The contractor shall install nail plates where cabling passes through wall studs. Where steel framing is used, plastic bushings must be installed wherever cables pass through metal structural members. The cables must not touch any edges of metal framing.

All cabling must be secured and supported at maximum 48" intervals using approved fastening methods as referenced on the InfiniSys drawing set and in a way that will not compress or deform the cables.

All cable bends must maintain a minimum 3" bend radius with the exception of RG-11, Hardline Coax and outside plant cable bends that must maintain a minimum bend radius equivalent to 10 times the OD of the cable under a no-load condition and 20 times the cable OD under a tensile load condition.

Cable pulling shall not at any time exceed the manufacturer's maximum pulling tension recommendations for the type of cable being installed.

Splicing or repair of cabling is not permitted. Damaged cable must be replaced in its entirety. Any defective or damaged cabling, or any cable or cable installation that does not meet these specifications, must be replaced. This will be at the AV contractor's expense, unless it is the result of gross negligence by another trade, or unavoidable because of subsequent changes, structural modifications, etc.

During rough-in, sufficient extra cable shall always be left for termination at each end. All rough-in cable ends in the A/V closet shall be placed in a plastic bag after labeling, and the bag taped around the cable bundle, so the cable ends will not be painted, textured, or damaged.

The installing contractor is responsible for measuring the distance of all cable runs. Any distances indicated by the accompanying drawing set or the scope of work are estimates.

The installing contractor is responsible for any required fire-stopping or smoke seals. No flammable materials may be used to line a chase or hole. All fire-stopping materials will meet applicable guidelines, standards, codes, rules and regulations.

### 3.2 Labeling

The installing contractor shall label all low voltage cables at both ends in a clear and legible manner. Cabling between equipment should be labeled at both ends with the function and device at both ends.

Both sides of a dual cable must be labeled, and unterminated cables must also be labeled. The label should be located within 2ft of the likely termination point after trim, so the label will not be cut off. All cable ends should be placed in a plastic bag after labeling, and the bag taped around the cable bundle, so the cable ends will not be painted, textured, or damaged.

### 3.3 Functionality

Each space has its own requirements based upon the projected usage of that space. The control and audio distribution should be fed from a single headend location, located in the clubhouse MCR.

### 3.4 Programming Parameters

It is required that control of the following programming parameters be included in the Audio/Video system.

- A. Background music volume limits at all areas
- B. Timed shutdown of background music at scheduled times.

### 3.5 System Initialization

All equipment shall be installed and tested in accordance with the manufacturers' recommendations. The AV Contractor shall test all required system functions and operation and demonstrate to a representative of the Owner that all components are operating properly, including all amplifiers, speakers, source equipment and electronics.

All speakers shall be tested for proper polarity and channel assignments.

All levels shall be set and the settings marked on the equipment for future reference.

### 3.6 Training

The AV Contractor shall provide on-site training on software and hardware maintenance of the AV system. Designated Site personnel shall be trained in all aspects of managing the Systems.

The Property Manager shall designate the employees to receive training on the system and ensure that they are present for the training session, and that at least one properly trained employee is always available on-site as needed. The Property Manager shall determine the date and time of the training session(s), and will determine when training is satisfactorily complete, and the designated personnel are comfortable with operating and maintaining the system.

The AV Contractor shall provide one additional training session at no additional charge, within the first year of operation, at the request of the Property Manager. Further training may be charged per the agreed Service Contract rate.

### 3.7 Walk-Through

The Owner requires a full walk-through with the AV Contractor project manager, to review every component in the System. The walk-thru shall include a full demonstration of the System.

### 3.8 System Acceptance

The Property Manager shall accept the AV system as complete when training is satisfactorily complete, the designated personnel are comfortable with operating and maintaining the system, and all agreed functions are operating properly.

END OF SECTION