

**360 Park Ave. South 6th, 7th & 8th Floors Non-Clinical AV**

Request for Proposal

January 3, 2016

Presented by:

**NYU Hospital Center**

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# Introduction

NYU Hospital Center (“NYUHC”) is one of the nation’s premier academic medical centers consisting of NYU Hospitals Center and NYU School of Medicine (the Owner for this project). Our trifold mission to serve, teach, and discover is achieved daily through an integrated academic culture devoted to excellence in patient care, education, and research.

**Our Leadership, Campus Transformation, and Community Service Plan**

Located in the heart of Manhattan, with additional facilities throughout the New York City area, NYUHC operates three inpatient facilities – Tisch Hospital, NYU Hospital for Joint Diseases, and the NYU Lutheran Medical Center and numerous ambulatory facilities.

Additionally, our growing outpatient network brings our world-class medical services directly to the communities where our patients live and work. When care that is more complex is needed, we bridge the gap between our community-based practices and our hospitals to provide a seamless healthcare experience.

Our campus transformation program is reshaping NYUHC through construction, renovations, and expansions. The acquisition of 360 Park Ave. South 6th, 7th and 8th floors is the latest addition to our ever growing landscape in the heart of New York City. Located in the Flat Iron district, this historic, twenty-floor building, constructed in 1912 has a traditional look. Each floor has an estimated 23,116 sqft of non-clinical space. The building has an attended lobby and a state-of-the-art ADA compliant Class "E" Life Safety System. Fiber optics and internet access is available throughout the building. Each floor has loft space, three wet columns, and variable air volume A/C systems. The freight entrance is on East 26th Street. Located 100 feet from Madison Square Park, the building is in close proximity to the L, N, R, 4, 5, and 6 subway lines.

**Project Overview**

NYUHC is conducting a Request for Proposal (RFP) for the design, furnishing of equipment, installation and support of the non-surgical/procedure audiovisual systems floors 6, 7 & 8 located at 360 Park Ave. South, (the “Project”). NYUHC invites you (the “Proposer”) to submit a proposal in accordance with the requirements, terms, and conditions in this RFP.

The section below provides a general breakdown of the rooms and systems included in the Scope of Work. For system descriptions and functional narratives, refer to Section 15-1

**Large Conference room**

This room will be located on the sixth floor and will be the crown jewel of the MCIT meeting areas. Its intended use will be for large, executive-level meetings and conferences upwards of 40+ participants locally, plus additional remote sites. We will have a 98” monitor at the front of the room and a 70” on the side, wall for optimal viewing of documents and presentation.

**Medium Conference room**

Able to seat up to 12 people this bookable space is perfect for team meetings. These rooms will be the workhorse of the floor. Used constantly throughout the day for weekly team meetings, client and vender visits and collaboration with larger groups.

**Small Conference room**

The Small conference room will be used by groups up to 6. It will have the same general functions as a Medium Conference Room.

**Discussion Rooms**

Discussion room will be unbookable space used for small groups to huddle around a table and go over details of a project. This unique space will be for quick progress meeting, brain storming sessions or a quiet place to work away from the cube farm. There will be limited technology in this space. Monitors will be used to display documents or drawing for discussion. This room will not have video conference capabilities.

**Phone room**

Phone rooms intended for a single person to use for private voice or video conversation.

**Training room**

There are 3 different size training rooms planned for this space. Small for up to 8 students and instructor, Medium for up to 17 students and instructor and Large for up to 29 students and instructor. Lectures and classes in the large conference rooms will have recording capability and the ability for streamed live via Webex.

# Milestone Calendar

The following calendar of events based on planned NYUHC activities and anticipated Proposer delivery capabilities.

|  |  |  |  |
| --- | --- | --- | --- |
| *Milestones* | *Date* | *Time* |  |
|  |
| RFP Release Date | January 3, 2016 |  |  |
| Acknowledgement of Proposal and notification of intent to bid | January 6, 2017 | 5 PM |  |
| All inquiries submitted by Proposers / Closing Date | January 11, 2017 | 5 PM |  |
| NYUHC responses to inquiries sent out | January 18, 2017 | 5 PM |  |
| All proposals are due | January 25,2017 | 5PM |  |
| NYUHC anticipates awarding a contract | February 2, 2107 |  |  |
| Cabling / Rough in | 1st – 2nd Quarter 2017 |  |  |
| Installation and Commissioning | April 1, 2017 |  |  |
| Temporary Certificate of Occupancy | June 1, 2017 |  |  |
| Substantial Construction Completion [General Contractor] | June 1, 2017 |  |  |
| Go Live | June 1, 2017 |  |  |
|  |  |  |  |

# Proposal Submission Requirements

All proposers who plan to submit a proposal shall notify NYUHC by email to [ITSourcing@NYUHC.org](mailto:ITSourcing@nyumc.org) no later than 5PM Eastern, January 6, 2017. Password to download RFP files will be provided when proposer notifies NYUHC of interest to submit a proposal.

## Proposals shall be made only on the forms provided and all blank and underlined spaces in the forms shall be fully completed.

## Proposals shall be submitted electronically to [ITSourcing@NYUHC.org](mailto:ITSourcing@nyumc.org) no later than 1 p.m. on January 25, 2017.  Late proposals will not be considered.

## If you choose not to submit a proposal please submit a declination letter to [ITSourcing@NYUHC.org](mailto:ITSourcing@nyumc.org) at the earliest.

Note to Proposers: All questions regarding interpretation or specifications must be submitted in writing to [ITSourcing@NYUHC.org](mailto:ITSourcing@nyumc.org) only. **Under no circumstances will proposer contact any employee of NYUHC.** Any dialogue initiated by the Proposer not addressed to contacts above will result in immediate disqualification. Discussions on other business matters not related to this RFP are acceptable.

# Proprietary Information, Non-Disclosure

Proposer shall have no rights to this document or the information contained therein and shall not duplicate or disseminate said document or information outside the proposer's organization without the prior written consent of NYUHC.

# Costs Incurred

All costs incurred in the preparation of the Proposal must be borne by the Proposer. By submitting a Proposal, the Proposer agrees that the rejection of any Proposal, in whole or in part, will not render NYUHC liable for incurred costs and damages.

# RFP Proposal Terms

Proposals are to be based on the requirements contained in this RFP and referenced documents unless exceptions are taken by the Proposer as clearly redlined or annotated in the Proposal. NYUHC reserves the right to negotiate the final scope of work, and price before entering into a contract. Specifications, requirements or descriptions not clearly redlined or annotated in the Proposal shall be deemed accepted by the Proposer. Additionally, by submitting a proposal, the Proposer acknowledges that NYUHC reserves the right to incorporate any or all of the Proposer’s RFP responses into final contracts and NYUHC reserves the right to award all or any portion(s) of the Work to persons other than the Proposer.

Finally, NYUHC reserves the right to adjust the evaluation criteria after finalizing the scope and pricing requirements at any time and to award a contract to any Proposer as NYUHC determines in its sole discretion to in its best interests.

# NYUHC Reserves Right to Refuse Any and All Proposals

Nothing in this RFP shall create any binding obligation upon NYUHC. Moreover, NYUHC, at its sole discretion, reserves the right to reject any and all proposals as well as the right not to award any contract under this proposal process.

# Effective Period of Prices

All pricing Proposals by Proposer will remain fixed and firm through January 1st, 2018.

# Software and Licensing

All software, firmware and licenses necessary to achieve full functionality must be included.

All software update software services must be included in support or maintenance services proposal, including firmware updates and any other software related to the solution.

# Pricing

A proposal submission form is included for the Proposer to provide both services and equipment breakdown and the total lump sum price. For services, a rate card must also be submitted.

# Company Profile

The Proposer will offer a comprehensive package for storage services as specified in this RFP to all NYUHC facilities. All questions in this RFP document must be answered.

All Proposers are required to fill out the Contractor qualification questionnaire provided as an attachment to this RFP as well as to indicate your compliance with and document any exceptions to each of the following requirements to demonstrate overall firm history of integrity, safety and financial stability

In addition, please provide:

1. The company’s full name, address, main telephone and appropriate contact information including e-mail address.
2. A brief historical perspective on your company (years in the business, growth via mergers and acquisitions, key industry innovations.)
3. What are your company values?
4. Describe your corporate culture. Explain how you differentiate yourself from your competition.
5. Describe the full range of services your company offers and the corresponding rates. Include all services that will be available and all expenses that we would incur under this agreement.
6. List office locations and specific responsibilities of each area.
7. Please provide an overview of your company’s growth over the past five years.
8. Provide audited financial statement for the two fiscal years immediately prior to this one.
9. What percentage of your business is in healthcare?
10. Company description: including ownership, number of years in business, strategic direction, mission, history, acknowledgements or awards.
11. Recent financial results.
12. Partner relationships.
13. Description of selection criteria for contractor or co-implementation partners
14. Work force distribution by country, city, state, etc.
15. Total number of employees: Include number of project managers, implementation specialists, development engineers, % full time versus contracted, etc.
16. Average number of years of application and implementation experience and business process definition for consultants and managers.

# Past Performance and References

1. Provide at least three (3) references of past deployments in a hospital or enterprise environment setting of similar size and scope of NYUHC. NYUHC may arrange site visits to review the deployments implemented by the proposer.

For each reference, please include the following:

1. Organization name, contact name, title, address and telephone number.
2. Describe the relationship and services provided.
3. Provide current and past account information, of similar size and configuration. Include:
   1. A current, long-term customer.
   2. A current customer implemented in the past 18 months.
   3. A former customer terminated within the past 18 months and reasoning for termination other than consolidation.
4. If you cannot provide at least one reference of a similar size and scope of NYUHC, please explain and indicate the largest installation you have performed.

Failure to provide suitable references to NYUHC will result in the immediate disqualification of proposer’s proposal without further consideration.

# Evaluation Criteria

NYUHC plans to evaluate the Proposer’s response based on the following criteria. Your proposal should address all items below. All Proposers shall be evaluated on their demonstration of moral, financial and technical responsibility.

**Technical Evaluation Criteria**

1. Approach to the Work

2. Functional Requirements

3. Proposed Project Team

* The qualifications and experience of proposer’s proposed project team

4. Prior Project Experience

* Quality of Professional Services

5. Overall Firm Background

* Customer Service

6. Understanding of NYUHC

* Demonstrated familiarity with NYUHC culture, priorities and unique needs, including work in a dense urban campus, and managing projects with an emphasis on sustainability, cost effectiveness, and efficiency

7. Redlined Contracting Terms

**Price Evaluation Criteria**

1. Proposed pricing for both the initial design and installation and for ongoing maintenance, licensing, and any other support costs.

# Proposal Submission Form

Proposers shall fill out the Proposal submission form on the following page and return with their Proposal in accordance with the instruction in Section 3 Proposal Submission Requirements.

**PROPOSAL SUBMISSION FORM**

**COMPANY NAME: *(To be completed by Proposer)***

**PROJECT: 360 Park Ave. South 6th, 7th & 8th floor**

**LOCATION: 360 Park Ave. South, New York, New York 10010**

**SUBSTANTIAL COMPLETION DATE: *(To be completed by Proposer)***

**TOTAL LUMP SUM PRICE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

The undersigned has carefully examined all RFP materials and exhibits, the form of Contract, and special provisions and addenda, if any, and that the undersigned has inspected the actual location of the work, and is satisfied as to all circumstances and conditions, including customer requirements and the installation environment, and proposes to furnish all services, equipment, materials, supplies, tools, and labor to design, install complete and support all the Work required in conformity with the plans, specifications and the form of Contract subject only to the express exceptions, clarifications, alternates, allowances and options set forth in the Proposal.

The undersigned hereby agrees to engage in good faith efforts to finalize and execute the form of Contract included with the RFP as may be directed by NYUHC within a reasonable time following acceptance of this Proposal, if any, and further agrees to complete the entire work covered by this Proposal within the number of consecutive calendar days as indicated in the Proposal from the date of NYUHC’s written Notice to Proceed with the Work.

SIGNATURE OF PROPOSER**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Name Title

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Printed Name Date

Notary Seal

Business address of Proposer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Contact phone \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# E-mail address \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_General Functional Specifications

## The General Functional Specifications shall be applicable to all systems listed under the Scope of Work.

## System Interconnection & Functional Description

## The functional interconnections of the audio, video and control systems shall be as detailed on drawings #TA-601.00 thru TA-607.00

## The Contractor shall provide all interconnection cable, connectors, terminal strips, wire ways, flexible conduit, etc., to facilitate the audiovisual systems as detailed within these specifications and drawings.

## The conduit and power systems are detailed in the Electrical Engineer’s drawings.

## Coordinate all cable pulls with the Structured Cabling Contractor.

## Control

## Provide remote control of systems with an integrated network-based master controller that provides ports for IR/serial, RS-232/422/485, Ethernet, relay closures and input and output control card frames and rack mounted, as indicated on the drawings and in this specification.

## Provide control of all equipment as indicated within this specification and as indicated on drawings.

## Provide all loose cables, connectors, etc. required to complete a full working system.

## Coordinate with the owner and provide system interface to the local IP network (LAN). Provide interfacing of multiple control systems components over IP, for the application of future interface to any Owner-furnished AV-system monitoring systems.

## When a choice of control protocols is available for a piece of equipment, the most secure and flexible one shall be used; i.e. RS-232 control, where available, shall be used in place of either infrared or relay control.

## Where the power state of a piece of equipment is indeterminate, power sensors shall be provided to indicate the devices power state to prevent misalignment of system and equipment power cycles.

## User Interface

## Provide programming of control interfaces as directed by the Client and Consultant. Programming shall provide simple user interface to select local video and audio sources, and adjust room and area volume and local microphone levels to within predetermined limits throughout the Conference Room.

## Provide control panel operations that are consistent from page to page.

## Provide control panel operations that are consistent from room to room and/or station to station.

## Provide feedback that indicates the current equipment and/or system status where possible.

## 

## Software

## Provide control capability for every function available on every piece of equipment being controlled by the system. Define and provide “macro” commands for the most used functions.

## Provide password protection for any operations that can adversely affect certain room set-up functions. Provide for the ability for remote monitoring of system functions and adjustments via TCP/IP. Capability for configuration will require password protection for use of facility management. Provide for the delivery of email fault alerts to facility management.

## 

## Miscellaneous

## Provide and install all hardware, cabling, connectors, faceplates, terminators, adapters, audio combiners, balanced-unbalanced audio converters, wall boxes, etc. required to ensure installation of a fully functional audiovisual system as depicted in the attached AV Systems drawings.

## Provide table box enclosures, complete with power modules, data jacks, audiovisual connections, and grommets for audiovisual cables at the table. The finish for the table box enclosures shall be brushed aluminum. Cutouts for the enclosures at the table shall be provided by the table vendor.

## Equipment Layout

## The equipment in this area shall be as detailed on drawings.

## Provide audiovisual equipment racks with blank and vent panels as indicated on the drawings. There are not to be any open areas on the front of the racks.

## All equipment shall be installed with rack ears/mounts or custom rack-mounts/face-plates, using security screws. There shall not be any shelf-mounted components in the audiovisual racks.

## Owner Furnished Equipment

## All room furniture will be furnished by the Owner (Unless otherwise noted in this specification).

## All laptop and dedicated room PCs will be furnished by the Owner.

## All Room Scheduling Panels will be furnished by the Owner and Installed by the AV Contractor.

## All Cisco equipment, including CODECs, network switches, and cameras, will be furnished by the Owner.

## All Apple iPad wireless control tablet interfaces will be furnished by the Owner.

## Related Work Specified Elsewhere

## The following systems and equipment are not provided under this contract. The Contractor is to coordinate with the base bid contractors as necessary to insure compatibility.

## Installation of all furniture stub-ups, floor boxes and/or poke thru devices (excluding any plates and connectors to be provided by the contractor.

## Telephone and telecommunications jacks and special telecom outlets not related directly to AV, (LAN/WAN, ISDN, POTS, etc.).

# Detailed Specifications; Typical Conference Rooms

* + - 1. AREA: PHONE ROOM (TYPICAL)
         1. General Audiovisual functionally of the space:

The video presentation and audio communications will be distributed via an all-in-one unit.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**VIDEO**

Provide and install an all-in-one stand-alone desktop unit for audio and video communications via the clients Unified Communications.

**MISCELLANEOUS**

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

All room furniture shall be provided by the Owner.

All dedicated room computers (PCs) shall be provided by the Owner.

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.)

Floor boxes, junction boxes, conduit, and raceway.

Conference table multi-service table-top box.

* + - 1. AREA: RECEPTION LOBBY (TYPICAL)
         1. General Audiovisual functionally of the space:

The video presentation will be distributed via a single HD flat panel display.

The sources can be selected from the following option(s):

Digital signage player, mounted behind the flat panel display

Control of all Audiovisual system will be with XPanel controls via tablet/laptop using any Web browser interface.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**VIDEO**

Provide and install LED backlit thin profile, HD flat panel display. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of 1920x 1080.

Provide and install tilt-wall mount with all accessories required to mount the flat panel display secured to the wall.

**CONTROL**

Provide and install network based control processor, mounted behind display.

Audiovisual Systems Integrator/Contractor shall be prepared to program and add any function of the equipment to be controlled, whether or not it is specifically called for in this base specification, as part of the control system development process.

Audiovisual Systems Integrator/Contractor to include programming and software for Ethernet based control for remote diagnostics, control and notification via access from an authorized web based computer. Coordination with client IT department is required.

Audiovisual Systems Integrator/Contractor is responsible for Control System programming and touch panel layouts (to be coordinated with Owner) required to make the Audiovisual System operational.

**MISCELLANEOUS**

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

All room furniture shall be provided by the Owner.

All dedicated room computers (PCs) shall be provided by the Owner.

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.).

Floor boxes, junction boxes, conduit, and raceway

* + - 1. AREA: DISCUSSION ROOM (TYPICAL FOR TYPE A AND B)
         1. General Audiovisual functionally of the space:

The video presentation will be distributed via a single HD flat panel display.

The sources can be selected from the following option(s):

Wireless AV Presentation Gateway

Control of all Audiovisual system will be via wall mounted control touch panel.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**VIDEO**

Provide and install LED backlit thin profile, HD flat panel display, sized for the room. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of True 4K. The panel shall have built-in tuner.

Provide and install tilt-wall mount with all accessories required to mount the flat panel display secured to the wall.

Provide and install wireless AV presentation gateway, behind flat panel display. Coordinate with Client’s IT to provide network configurations.

**CONTROL**

Provide and install (1) wall mount accessory for OFE iPad for control functionalities.

Provide and install network based control processor, mounted behind display.

Audiovisual Systems Integrator/Contractor shall be prepared to program and add any function of the equipment to be controlled, whether or not it is specifically called for in this base specification, as part of the control system development process.

Audiovisual Systems Integrator/Contractor to include programming and software for Ethernet based control for remote diagnostics, control and notification via access from an authorized web based computer. Coordination with client IT department is required.

Audiovisual Systems Integrator/Contractor is responsible for Control System programming and touch panel layouts (to be coordinated with Owner) required to make the Audiovisual System operational.

**MISCELLANEOUS**

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

All room furniture shall be provided by the Owner.

All dedicated room computers (PCs) shall be provided by the Owner.

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.)

Floor boxes, junction boxes, conduit, and raceway.

Conference table multi-service table-top box.

* + - 1. AREA: COLLABORATION ROOM (TYPICAL FOR TYPE A)
         1. General Audiovisual functionally of the space:

The video presentation will be distributed via a single HD flat panel display.

The sources can be selected from the following option(s):

Wireless AV Presentation Gateway

Control of all Audiovisual system will be via wall mounted control touch panel. XPanel controls via tablet/laptop using any Web browser interface.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**VIDEO**

Provide and install LED backlit thin profile, HD flat panel display, sized for the room. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of 1920x 1080. The panel shall have built-in tuner.

Provide and install tilt-wall mount with all accessories required to mount the flat panel display secured to the wall.

Provide and install wireless AV presentation gateway, behind flat panel display. Coordinate with Client’s IT to provide network configurations.

**CONTROL**

Provide and install network based control processor, mounted behind display.

Audiovisual Systems Integrator/Contractor shall be prepared to program and add any function of the equipment to be controlled, whether or not it is specifically called for in this base specification, as part of the control system development process.

Audiovisual Systems Integrator/Contractor to include programming and software for Ethernet based control for remote diagnostics, control and notification via access from an authorized web based computer. Coordination with client IT department is required.

Audiovisual Systems Integrator/Contractor is responsible for Control System programming and touch panel layouts (to be coordinated with Owner) required to make the Audiovisual System operational.

**MISCELLANEOUS**

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

All room furniture shall be provided by the Owner.

All dedicated room computers (PCs) shall be provided by the Owner.

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.)

Floor boxes, junction boxes, conduit, and raceway.

Conference table multi-service table-top box.

* + - 1. AREA: SMALL CONFERENCE ROOM (TYPICAL FOR TYPE A & B)
         1. General Audiovisual functionally of the space:

The program audio, Audio-teleconferencing (ATC) and Video-teleconferencing (VTC) audio will be distributed via a system of ceiling mounted loudspeakers and through-table microphones.

There is one form of ATC/VTC system via through-table microphones.

Users/Tech Support personnel will have the option of activate/mute the table microphones for ATC/VTC as they see fit.

The video presentation will be distributed via a single 4K-UHD flat panel display.

The video-teleconferencing camera will be auto-tracking pan/tilt/zoom capable, wall mounted below the flat panel display.

The sources can be selected from the following options:

Dedicated computer with extended USB connectivity at the table,

Wireless audiovisual presentation gateway,

Wired audiovisual connectivity for Bring Your Own Device (BYOD).

Control of all Audiovisual system will be via Owner Furnished tablet unit with loaded application for controls. XPanel controls via tablet/laptop using any Web browser interface.

Whiteboard with share-as-you-go technology.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**AUDIO**

Provide and install ceiling recessed loudspeakers with all mounting accessories as required.

Provide and install multi-channel Power Amplifier

Provide and install through-table Omni-directional microphones.

Provide and install DSP based audio matrix system. The system shall include VOIP/telephone conferencing interface, Audio Echo Cancellation, etc.

**VIDEO**

Provide and install LED backlit thin profile, 4K-UHD flat panel display, sized for the room/space. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of 4K-UHD.

Provide and install tilt-wall mount with all accessories required to mount the flat panel display secured to the wall.

Provide integration and testing of OFE dedicated computer(s), mounted on shelf at equipment rack; including OFE wireless keyboard and mouse.

Provide and install input connectivity plate for BYOD devices, via multi-format STP transmitter (under table mounted).

Provide and install wireless audiovisual connectivity for BYOD devices via an AV Presentation Gateway for Windows and OS X computers, as well as iOS, and Android mobile devices.

Provide and install video tele-conferencing integrator package kit; including video CODEC, HD camera, and control touch panel.

Provide and install (1) Video/Audio matrix switcher to route digital/analog video and audio signals, as shown on the AV system drawings.

All-in-one matrix switcher with built-in control processor. The matrix switcher shall be based on digital/analog media over STP technology.

Provide and install multi-format over STP transmitters to be installed inside wall plate or under the table.

Provide and install video signal over STP receivers with built-in controller and scaler.

**CONTROL**

Provide configuration for owner furnished (OFE) tablet with pre-loaded application for control.

Provide desktop docking station for owner furnished (OFE) tablet for control applications.

Provide configuration for owner furnished (OFE) tablet for room scheduling purpose.

Provide and install wall docking station for owner furnished (OFE) tablet for room scheduling purpose; including glass mounting and power accessories.

Provide and install any/all additional I/O module ports for the control processor unit.

Touch Panel layouts shall have two (2) levels of operations, as follows:

For the end-users for normal operation of all audio-visual devices (i.e. Presentation, audio-conferencing, video-conferencing, etc.) including the environmental items such as lighting presets, etc.

For the tech personnel level of operation, there shall be a more advanced level of operation such as: in room speech reinforcement, video conference camera control, manual routing, automatic system shut down setting, etc.

Audiovisual Systems Integrator/Contractor shall be prepared to program and add any function of the equipment to be controlled, whether or not it is specifically called for in this base specification, as part of the control system development process.

Audiovisual Systems Integrator/Contractor to include programming and software for Ethernet based control for remote diagnostics, control and notification via access from an authorized web based computer. Coordination with client IT department is required.

Audiovisual Systems Integrator/Contractor is responsible for Control System programming and touch panel layouts (to be coordinated with Owner) required to make the Audiovisual System operational.

**MISCELLANEOUS**

Provide and install whiteboard with built-in “share-as-you-go” technology. Extend the power supply from the whiteboard to the equipment rack.

Provide and install occupancy sensor to provide room usage status for the system to automatically wake-up and/or shut-down. Timer for each function at the discrepancy of the client.

Provide and install USB extenders, USB switchers, and USB plates; as shown on the Audiovisual system drawings.

Provide and install (1) small-size equipment rack with rotating/sliding rail system to be integrated inside credenza, completed with all power strips, enclosing panels, blank and vent plates, wire ways, security covers, and miscellaneous hardware.

Lighting control preset switches and dimming system by others. Coordinate with respective trade for integration into the audiovisual system.

Provide On/Off master power switch and power surge protectors. Audiovisual Systems Integrator/Contractor shall verify and coordinate the grounding with electrical Audiovisual Systems Integrator/Contractor.

Provide and install table/floor/wall mounted input/output connectivity plate(s), as shown on the Audiovisual system drawings.

Provide audio and video patch panels, distribution amplifiers and all other items as required to complete full working system.

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

All room furniture shall be provided by the Owner.

All dedicated room computers (PCs) shall be provided by the Owner.

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.)

Floor boxes, junction boxes, conduit, and raceway.

Conference table multi-service table-top box.

* + - 1. AREA: MEDIUM CONFERENCE ROOM (TYPICAL)
         1. General Audiovisual functionally of the space:

The program audio, Audio-teleconferencing (ATC) and Video-teleconferencing (VTC) audio will be distributed via a system of ceiling mounted loudspeakers and through-table microphones.

There is one form of ATC/VTC system via through-table microphones.

Users/Tech Support personnel will have the option of activate/mute the table microphones for voice lift or ATC/VTC as they see fit.

The video presentation will be distributed via a single 4K-UHD flat panel display.

The video-teleconferencing camera will be auto-tracking pan/tilt/zoom capable, wall mounted below the flat panel display.

The sources can be selected from the following options:

Dedicated computer with extended USB connectivity at the table,

Wireless audiovisual presentation gateway,

Wired audiovisual connectivity for Bring Your Own Device (BYOD).

Control of all Audiovisual system will be via Owner Furnished tablet unit with loaded application for controls. XPanel controls via tablet/laptop using any Web browser interface.

Whiteboard with share-as-you-go technology.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**AUDIO**

Provide and install ceiling recessed loudspeakers with all mounting accessories as required.

Provide and install multi-channel Power Amplifier

Provide and install through-table Omni-directional microphones.

Provide and install DSP based audio matrix system. The system shall include VOIP/telephone conferencing interface, Audio Echo Cancellation, etc.

**VIDEO**

Provide and install LED backlit thin profile, 4K-UHD flat panel display, sized for the room/space. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of 4K-UHD.

Provide and install tilt-wall mount with all accessories required to mount the flat panel display secured to the wall.

Provide integration and testing of OFE dedicated computer(s), mounted on shelf at equipment rack; including OFE wireless keyboard and mouse.

Provide and install input connectivity plate for BYOD devices, via multi-format STP transmitter (under table mounted).

Provide and install wireless audiovisual connectivity for BYOD devices via an AV Presentation Gateway for Windows and OS X computers, as well as iOS, and Android mobile devices.

Provide and install video tele-conferencing integrator package kit; including video CODEC, HD camera, and control touch panel.

Provide and install (1) Video/Audio matrix switcher to route digital/analog video and audio signals as shown on the AV system drawings.

Card-based modular matrix switcher. The matrix switcher shall be based on digital/analog media over STP technology.

Provide and install multi-format over STP transmitters to be installed inside wall plate or under the table.

Provide and install video signal over STP receivers with built-in controller and scaler.

**CONTROL**

Provide configuration for owner furnished (OFE) tablet with pre-loaded application for control.

Provide desktop docking station for owner furnished (OFE) tablet for control applications.

Provide configuration for owner furnished (OFE) tablet for room scheduling purpose.

Provide and install wall docking station for owner furnished (OFE) tablet for room scheduling purpose; including glass mounting and power accessories.

Provide and install (1) control processor unit, with any additional I/O module port.

Touch Panel layouts shall have two (2) levels of operations, as follows:

For the end-users for normal operation of all audio-visual devices (i.e. Presentation, audio-conferencing, video-conferencing, etc.) including the environmental items such as lighting presets, etc.

For the tech personnel level of operation, there shall be a more advanced level of operation such as: in room speech reinforcement, video conference camera control, manual routing, automatic system shut down setting, etc.

Audiovisual Systems Integrator/Contractor shall be prepared to program and add any function of the equipment to be controlled, whether or not it is specifically called for in this base specification, as part of the control system development process.

Audiovisual Systems Integrator/Contractor to include programming and software for Ethernet based control for remote diagnostics, control and notification via access from an authorized web based computer. Coordination with client IT department is required.

Audiovisual Systems Integrator/Contractor is responsible for Control System programming and touch panel layouts (to be coordinated with Owner) required to make the Audiovisual System operational.

**MISCELLANEOUS**

Provide and install whiteboard with built-in “share-as-you-go” technology. Extend the power supply from the whiteboard to the equipment rack.

Provide and install occupancy sensor to provide room usage status for the system to automatically wake-up and/or shut-down. Timer for each function at the discrepancy of the client.

Provide and install USB extenders, USB switchers, and USB plates; as shown on the Audiovisual system drawings.

Provide and install (2) small-size equipment rack with rotating/sliding rail system to be integrated inside credenza, completed with all power strips, enclosing panels, blank and vent plates, wire ways, security covers, and miscellaneous hardware.

Lighting control preset switches and dimming system by others. Coordinate with respective trade for integration into the audiovisual system.

Provide On/Off master power switch and power surge protectors. Audiovisual Systems Integrator/Contractor shall verify and coordinate the grounding with electrical Audiovisual Systems Integrator/Contractor.

Provide and install table/floor/wall mounted input/output connectivity plate(s), as shown on the Audiovisual system drawings.

Provide audio and video patch panels, distribution amplifiers and all other items as required to complete full working system.

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

The Owner shall provide all room furniture.

The Owner shall provide all dedicated room computers (PCs).

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.)

Floor boxes, junction boxes, conduit, and raceway.

Conference table multi-service table-top box.

* + - 1. AREA: LARGE CONFERENCE ROOM
         1. General Audiovisual functionally of the space:

The program audio, Audio-teleconferencing (ATC) and Video-teleconferencing (VTC) audio will be distributed via a system of ceiling mounted loudspeakers and through-table microphones.

There is one form of ATC/VTC system via through-table microphones.

Users/Tech Support personnel will have the option of activate/mute the table microphones for voice lift or ATC/VTC as they see fit.

The video presentation will be distributed via a single 4K-UHD flat panel display.

The video-teleconferencing camera will be auto-tracking pan/tilt/zoom capable, wall mounted below the flat panel display.

The sources can be selected from the following options:

Dedicated computer with extended USB connectivity at the table,

Wireless audiovisual presentation gateway,

Wired audiovisual connectivity for Bring Your Own Device (BYOD).

Control of all Audiovisual system will be via Owner Furnished tablet unit with loaded application for controls. XPanel controls via tablet/laptop using any Web browser interface.

Whiteboard with share-as-you-go technology.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**AUDIO**

Provide and install ceiling recessed loudspeakers with all mounting accessories as required.

Provide and install multi-channel Power Amplifier

Provide and install through-table Omni-directional microphones.

Provide and install DSP based audio matrix system. The system shall include VOIP/telephone conferencing interface, Audio Echo Cancellation, etc.

**VIDEO**

Provide and install LED backlit thin profile, 4K-UHD flat panel display, sized for the room/space. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of 4K-UHD.

Provide and install supplemental LED backlit thin profile, 4K-UHD flat panel display, sized for the area of coverage. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of 4K-UHD.

Provide and install tilt-wall mounts with all accessories required to mount the flat panel display secured to the wall.

Provide integration and testing of OFE dedicated computer(s), mounted on shelf at equipment rack; including OFE wireless keyboard and mouse.

Provide and install input connectivity plate for BYOD devices, via multi-format STP transmitter (under table mounted).

Provide and install wireless audiovisual connectivity for BYOD devices via an AV Presentation Gateway for Windows and OS X computers, as well as iOS, and Android mobile devices.

Provide and install video tele-conferencing integrator package kit; including video CODEC, HD camera, and control touch panel.

Provide and install (1) Video/Audio matrix switcher to route digital/analog video and audio signals as shown on the AV system drawings.

Card-based modular matrix switcher. The matrix switcher shall be based on digital/analog media over STP technology.

Provide and install multi-format over STP transmitters to be installed inside wall plate or under the table.

Provide and install video signal over STP receivers with built-in controller and scaler.

**CONTROL**

Provide configuration for owner furnished (OFE) tablet with pre-loaded application for control.

Provide desktop docking station for owner furnished (OFE) table for control applications.

Provide configuration for owner furnished (OFE) table for room scheduling purpose.

Provide and install wall docking station for owner furnished (OFE) tablet for room scheduling purpose; including glass mounting and power accessories.

Provide and install (1) control processor unit.

Touch Panel layouts shall have two (2) levels of operations, as follows:

For the end-users for normal operation of all audio-visual devices (i.e. Presentation, audio-conferencing, video-conferencing, etc.) including the environmental items such as lighting presets, etc.

For the tech personnel level of operation, there shall be a more advanced level of operation such as: in room speech reinforcement, video conference camera control, manual routing, automatic system shut down setting, etc.

Audiovisual Systems Integrator/Contractor shall be prepared to program and add any function of the equipment to be controlled, whether or not it is specifically called for in this base specification, as part of the control system development process.

Audiovisual Systems Integrator/Contractor to include programming and software for Ethernet based control for remote diagnostics, control and notification via access from an authorized web based computer. Coordination with client IT department is required.

Audiovisual Systems Integrator/Contractor is responsible for Control System programming and touch panel layouts (to be coordinated with Owner) required to make the Audiovisual System operational.

**MISCELLANEOUS**

Provide and install whiteboard with built-in “share-as-you-go” technology. Extend the power supply from the whiteboard to the equipment rack.

Provide and install occupancy sensor to provide room usage status for the system to automatically wake-up and/or shut-down. Timer for each function at the discrepancy of the client.

Provide and install USB extenders, USB switchers, and USB plates; as shown on the Audiovisual system drawings.

Provide and install (2) small-size equipment rack with rotating/sliding rail system to be integrated inside credenza, completed with all power strips, enclosing panels, blank and vent plates, wire ways, security covers, and miscellaneous hardware.

Lighting control preset switches and dimming system by others. Coordinate with respective trade for integration into the audiovisual system.

Provide On/Off master power switch and power surge protectors. Audiovisual Systems Integrator/Contractor shall verify and coordinate the grounding with electrical Audiovisual Systems Integrator/Contractor.

Provide and install table/floor/wall mounted input/output connectivity plate(s), as shown on the Audiovisual system drawings.

Provide audio and video patch panels, distribution amplifiers and all other items as required to complete full working system.

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

All room furniture shall be provided by the Owner.

All dedicated room computers (PCs) shall be provided by the Owner.

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.)

Floor boxes, junction boxes, conduit, and raceway.

Conference table multi-service table-top box.

* + - 1. AREA: SMALL TRAINING ROOM (TYPICAL OF 3)
         1. General Audiovisual functionally of the space:

The program audio will be distributed via a system of ceiling mounted loudspeakers and audio pick up via instructor’s microphone(s).

There is one form of audio pick up for voice lift system:

Wireless handheld and lavalier.

The video presentation will be distributed via a single 4K-UHD flat panel display.

The sources can be selected from the following options:

Dedicated computer with extended USB connectivity at the instructor’s location,

Wireless audiovisual presentation gateway,

Wired audiovisual connectivity for Bring Your Own Device (BYOD).

Control of all Audiovisual system will be via Owner Furnished tablet unit with loaded application for controls. XPanel controls via tablet/laptop using any Web browser interface.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**AUDIO**

Provide and install ceiling recessed loudspeakers with all mounting accessories as required.

Provide and install multi-channel Power Amplifier

Provide and install wireless microphone system, dual channel with proper antenna accessories. Each combo system shall include one (1) handheld and (1) lavalier microphone.

Provide and install DSP based audio matrix system. The system shall include VOIP/telephone conferencing interface, Audio Echo Cancellation, etc.

**VIDEO**

Provide and install LED backlit thin profile, 4K-UHD flat panel display, sized for the room/space. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of 4K-UHD.

Provide and install tilt-wall mount with all accessories required to mount the flat panel display secured to the wall.

Provide integration and testing of OFE dedicated computer(s), mounted on shelf at equipment rack; including OFE wireless keyboard and mouse.

Provide and install input connectivity plate for BYOD devices, via multi-format STP transmitter (under table mounted).

Provide and install wireless audiovisual connectivity for BYOD devices via an AV Presentation Gateway for Windows and OS X computers, as well as iOS, and Android mobile devices.

Provide and install (1) Video/Audio matrix switcher to route digital/analog video and audio signals as shown on the AV system drawings.

All-in-one matrix switcher with built-in control processor. The matrix switcher shall be based on digital/analog media over STP technology.

Provide and install multi-format over STP transmitters to be installed inside wall plate or under the table.

Provide and install video signal over STP receivers with built-in controller and scaler.

**CONTROL**

Provide configuration for owner furnished (OFE) tablet with pre-loaded application for control.

Provide and install wall mounted docking station for OFE tablet for control applications.

Provide configuration for owner furnished (OFE) table for room scheduling purpose.

Provide and install wall docking station for owner furnished (OFE) tablet for room scheduling purpose; including glass mounting and power accessories.

Provide and install any/all additional I/O module ports for the control processor unit.

Touch Panel layouts shall have two (2) levels of operations, as follows:

For the end-users for normal operation of all audio-visual devices (i.e. Presentation, audio-conferencing, video-conferencing, etc.) including the environmental items such as lighting presets, etc.

For the tech personnel level of operation, there shall be a more advanced level of operation such as: in room speech reinforcement, video conference camera control, manual routing, automatic system shut down setting, etc.

Audiovisual Systems Integrator/Contractor shall be prepared to program and add any function of the equipment to be controlled, whether or not it is specifically called for in this base specification, as part of the control system development process.

Audiovisual Systems Integrator/Contractor to include programming and software for Ethernet based control for remote diagnostics, control and notification via access from an authorized web based computer. Coordination with client IT department is required.

Audiovisual Systems Integrator/Contractor is responsible for Control System programming and touch panel layouts (to be coordinated with Owner) required to make the Audiovisual System operational.

**MISCELLANEOUS**

Provide and install whiteboard with built-in “share-as-you-go” technology. Extend the power supply from the whiteboard to the equipment rack.

Provide and install occupancy sensor to provide room usage status for the system to automatically wake-up and/or shut-down. Timer for each function at the discrepancy of the client.

Provide and install USB extenders, USB switchers, and USB plates; as shown on the Audiovisual system drawings.

Provide and install large-size equipment rack(s), completed with all power strips, enclosing panels, blank and vent plates, wire ways, security covers, and miscellaneous hardware. These racks are to be shared with other Training Rooms, as shown on the Audiovisual system drawings.

Lighting control preset switches and dimming system by others. Coordinate with respective trade for integration into the audiovisual system for the 6th Floor large conference room.

Provide On/Off master power switch and power surge protectors. Audiovisual Systems Integrator/Contractor shall verify and coordinate the grounding with electrical Audiovisual Systems Integrator/Contractor.

Provide and install table/floor/wall mounted input/output connectivity plate(s), as shown on the Audiovisual system drawings.

Provide audio and video patch panels, distribution amplifiers and all other items as required to complete full working system.

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

All room furniture shall be provided by the Owner.

All dedicated room computers (PCs) shall be provided by the Owner.

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.)

Floor boxes, junction boxes, conduit, and raceway.

Conference table multi-service table-top box.

* + - 1. AREA: MEDIUM TRAINING ROOM (TYPICAL OF 3)
         1. General Audiovisual functionally of the space:

The program audio will be distributed via a system of ceiling mounted loudspeakers and audio pick up via instructor’s microphone(s).

There is one form of audio pick up for voice lift system:

Wireless handheld and lavalier.

The video presentation will be distributed via a single 4K-UHD flat panel display.

The sources can be selected from the following options:

Dedicated computer with extended USB connectivity at the instructor’s location,

Wireless audiovisual presentation gateway,

Wired audiovisual connectivity for Bring Your Own Device (BYOD).

Control of all Audiovisual system will be via Owner Furnished tablet unit with loaded application for controls. XPanel controls via tablet/laptop using any Web browser interface.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**AUDIO**

Provide and install ceiling recessed loudspeakers with all mounting accessories as required.

Provide and install multi-channel Power Amplifier

Provide and install wireless microphone system, dual channel with proper antenna accessories. Each combo system shall include one (1) handheld and (1) lavalier microphone.

Provide and install DSP based audio matrix system. The system shall include VOIP/telephone conferencing interface, Audio Echo Cancellation, etc.

**VIDEO**

Provide and install LED backlit thin profile, 4K-UHD flat panel display, sized for the room/space. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of 4K-UHD.

Provide and install tilt-wall mount with all accessories required to mount the flat panel display secured to the wall.

Provide integration and testing of OFE dedicated computer(s), mounted on shelf at equipment rack; including OFE wireless keyboard and mouse.

Provide and install input connectivity plate for BYOD devices, via multi-format STP transmitter (under table mounted).

Provide and install wireless audiovisual connectivity for BYOD devices via an AV Presentation Gateway for Windows and OS X computers, as well as iOS, and Android mobile devices.

Provide and install (1) Video/Audio matrix switcher to route digital/analog video and audio signals as shown on the AV system drawings.

All-in-one matrix switcher with built-in control processor. The matrix switcher shall be based on digital/analog media over STP technology.

Provide and install multi-format over STP transmitters to be installed inside wall plate or under the table.

Provide and install video signal over STP receivers with built-in controller and scaler.

**CONTROL**

Provide configuration for owner furnished (OFE) tablet with pre-loaded application for control.

Provide and install wall mounted docking station for OFE tablet for control applications.

Provide configuration for owner furnished (OFE) table for room scheduling purpose.

Provide and install wall docking station for owner furnished (OFE) tablet for room scheduling purpose; including glass mounting and power accessories.

Provide and install any/all additional I/O module ports for the control processor unit.

Touch Panel layouts shall have two (2) levels of operations, as follows:

For the end-users for normal operation of all audio-visual devices (i.e. Presentation, audio-conferencing, video-conferencing, etc.) including the environmental items such as lighting presets, etc.

For the tech personnel level of operation, there shall be a more advanced level of operation such as: in room speech reinforcement, video conference camera control, manual routing, automatic system shut down setting, etc.

Audiovisual Systems Integrator/Contractor shall be prepared to program and add any function of the equipment to be controlled, whether or not it is specifically called for in this base specification, as part of the control system development process.

Audiovisual Systems Integrator/Contractor to include programming and software for Ethernet based control for remote diagnostics, control and notification via access from an authorized web based computer. Coordination with client IT department is required.

Audiovisual Systems Integrator/Contractor is responsible for Control System programming and touch panel layouts (to be coordinated with Owner) required to make the Audiovisual System operational.

**MISCELLANEOUS**

Provide and install whiteboard with built-in “share-as-you-go” technology. Extend the power supply from the whiteboard to the equipment rack.

Provide and install occupancy sensor to provide room usage status for the system to automatically wake-up and/or shut-down. Timer for each function at the discrepancy of the client.

Provide and install USB extenders, USB switchers, and USB plates; as shown on the Audiovisual system drawings.

Provide and install large-size equipment rack(s), completed with all power strips, enclosing panels, blank and vent plates, wire ways, security covers, and miscellaneous hardware. These racks are to be shared with other Training Rooms, as shown on the Audiovisual system drawings.

Lighting control preset switches and dimming system by others. Coordinate with respective trade for integration into the audiovisual system.

Provide On/Off master power switch and power surge protectors. Audiovisual Systems Integrator/Contractor shall verify and coordinate the grounding with electrical Audiovisual Systems Integrator/Contractor.

Provide and install table/floor/wall mounted input/output connectivity plate(s), as shown on the Audiovisual system drawings.

Provide audio and video patch panels, distribution amplifiers and all other items as required to complete full working system.

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

All room furniture shall be provided by the Owner.

All dedicated room computers (PCs) shall be provided by the Owner.

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.)

Floor boxes, junction boxes, conduit, and raceway.

Conference table multi-service table-top box.

* + - 1. AREA: EXTRA LARGE TRAINING ROOM (TYPICALOF 3)
         1. General Audiovisual functionally of the space:

The program audio, Audio-teleconferencing (ATC) and Video-teleconferencing (VTC) audio will be distributed via a system of ceiling mounted loudspeakers and audio pick up via instructor’s microphone(s).

There is one form of audio pick up for voice lift and ATC/VTC systems:

Wireless handheld and lavalier.

The video presentation will be distributed via a single 4K-UHD flat panel display.

The video-teleconferencing camera will be pan/tilt/zoom capable with presets, wall mounted to capture the Instructor’s location and front of the room.

The sources can be selected from the following options:

Dedicated computer with extended USB connectivity at the instructor’s location,

Wireless audiovisual presentation gateway,

Wired audiovisual connectivity for Bring Your Own Device (BYOD).

Control of all Audiovisual system will be via Owner Furnished tablet unit with loaded application for controls. XPanel controls via tablet/laptop using any Web browser interface.

Refer to the Audiovisual equipment list and the Audiovisual drawings for all audio and video related equipment to be provided and installed; including any miscellaneous items to render a turn-key solution.

* + - * 1. The Audiovisual Systems Integrator/Contractor shall provide the following Audiovisual Equipment and Functionality for this Room/Area/Space (Note: Unless Otherwise noted, ALL the following devices to be located/installed as shown on the Audiovisual Facilities and Electrical Plan Drawings. Final locations to be coordinated with Architect and General Contractor):

**AUDIO**

Provide and install ceiling recessed loudspeakers with all mounting accessories as required.

Provide and install multi-channel Power Amplifier

Provide and install wireless microphone system, dual channel with proper antenna accessories. Each combo system shall include one (1) handheld and (1) lavalier microphone.

Provide and install DSP based audio matrix system. The system shall include VOIP/telephone conferencing interface, Audio Echo Cancellation, etc.

**VIDEO**

Provide and install LED backlit thin profile, 4K-UHD flat panel display, sized for the room/space. The panel shall be capable of displaying very high quality images from all sources indicated on the drawings. The panel shall have a minimum native resolution of 4K-UHD.

Provide and install tilt-wall mount with all accessories required to mount the flat panel display secured to the wall.

Provide integration and testing of OFE dedicated computer(s), mounted on shelf at equipment rack; including OFE wireless keyboard and mouse.

Provide and install input connectivity plate for BYOD devices, via multi-format STP transmitter (under table mounted).

Provide and install wireless audiovisual connectivity for BYOD devices via an AV Presentation Gateway for Windows and OS X computers, as well as iOS, and Android mobile devices.

Provide and install video tele-conferencing integrator package kit; including video CODEC, HD camera, and control touch panel.

Provide and install (1) Video/Audio matrix switcher to route digital/analog video and audio signals as shown on the AV system drawings.

Card-based modular matrix switcher. The matrix switcher shall be based on digital/analog media over STP technology.

Provide and install multi-format over STP transmitters to be installed inside wall plate or under the table.

Provide and install video signal over STP receivers with built-in controller and scaler.

**CONTROL**

Provide configuration for owner furnished (OFE) tablet with pre-loaded application for control.

Provide and install wall mounted docking station for OFE tablet for control applications.

Provide configuration for owner furnished (OFE) table for room scheduling purpose.

Provide and install wall docking station for owner furnished (OFE) tablet for room scheduling purpose; including glass mounting and power accessories.

Provide and install (1) control processor unit, with any additional I/O module port.

Touch Panel layouts shall have two (2) levels of operations, as follows:

For the end-users for normal operation of all audio-visual devices (i.e. Presentation, audio-conferencing, video-conferencing, etc.) including the environmental items such as lighting presets, etc.

For the tech personnel level of operation, there shall be a more advanced level of operation such as: in room speech reinforcement, video conference camera control, manual routing, automatic system shut down setting, etc.

Audiovisual Systems Integrator/Contractor shall be prepared to program and add any function of the equipment to be controlled, whether or not it is specifically called for in this base specification, as part of the control system development process.

Audiovisual Systems Integrator/Contractor to include programming and software for Ethernet based control for remote diagnostics, control and notification via access from an authorized web based computer. Coordination with client IT department is required.

Audiovisual Systems Integrator/Contractor is responsible for Control System programming and touch panel layouts (to be coordinated with Owner) required to make the Audiovisual System operational.

**MISCELLANEOUS**

Provide and install whiteboard with built-in “share-as-you-go” technology. Extend the power supply from the whiteboard to the equipment rack.

Provide and install occupancy sensor to provide room usage status for the system to automatically wake-up and/or shut-down. Timer for each function at the discrepancy of the client.

Provide and install USB extenders, USB switchers, and USB plates; as shown on the Audiovisual system drawings.

Provide and install large-size equipment rack(s), completed with all power strips, enclosing panels, blank and vent plates, wire ways, security covers, and miscellaneous hardware. These racks are to be shared with other Training Rooms, as shown on the Audiovisual system drawings.

Lighting control preset switches and dimming system by others. Coordinate with respective trade for integration into the audiovisual system.

Provide On/Off master power switch and power surge protectors. Audiovisual Systems Integrator/Contractor shall verify and coordinate the grounding with electrical Audiovisual Systems Integrator/Contractor.

Provide and install table/floor/wall mounted input/output connectivity plate(s), as shown on the Audiovisual system drawings.

Provide audio and video patch panels, distribution amplifiers and all other items as required to complete full working system.

Provide all cabling, mounting hardware, jacks, plugs, security panels, junction and termination boxes, as required to provide a complete and working system.

* + - * 1. System Interconnections

The functional interconnections of the audio, video and control systems shall be as detailed on the Audiovisual Systems Drawings.

The Audiovisual Systems Integrator/Contractor shall provide all interconnection cable, connectors, terminal strips, wire way, flexible conduit, etc., required to implement the Audiovisual systems as detailed within these specifications and drawings.

The conduit and power system is detailed in the Electrical Engineer's drawings.

* + - * 1. Equipment Layout

The Audiovisual System and related equipment in this room shall be as located/installed/interconnected, etc., as detailed on the Audiovisual Facilities, Electrical, RCPs and Systems Drawings.

* + - * 1. Owner Furnished Equipment

All room furniture shall be provided by the Owner.

All dedicated room computers (PCs) shall be provided by the Owner.

* + - * 1. Related Work Specified Elsewhere

The following systems and equipment are not provided under this contract:

LAN connections.

Telephone jacks and special telecom outlets, (switched 56, ISDN, T1 etc.)

Floor boxes, junction boxes, conduit, and raceway.

Conference table multi-service table-top box.

## Installation Practices

## General

## Installation shall include the delivery to the installation site, unloading, setting in place, fastening to walls, floors, ceilings, counters, or other structures where required, interconnecting wiring of the system components, equipment alignment and adjustment, programming and configuration and all other work whether or not expressly required herein which is necessary to result in complete and fully operational systems.

## Prior to ordering equipment, the contractor shall coordinate the frequencies of all wireless devices to prevent unwanted interaction between devices and rooms. This includes, but is not limited to, wireless microphones, assisted listening system devices, wireless control panels, etc.

## All accessories, including rack mounting hardware, power supplies, etc., shall be obtained from the original equipment manufacturer. Unless otherwise noted or specified, third party accessories shall not be used.

## All installation practices shall be in accordance with, but not limited to, these specifications and drawings. Installation shall be performed in accordance with the applicable standards, requirements, and recommendations of National, State, and Local authorities having jurisdiction.

## If, in the opinion of the Contractor, an installation practice is desired or required, which is contrary to these specifications or drawings, a written request for modification shall be made to the Design Team. Modifications shall not commence without written approval from the Design Team

## During the installation, and up to the date of final acceptance, the Contractor shall be under obligation to protect his finished and unfinished work against damage and loss. In the event of such damage or loss, the damage shall be replaced or repaired at no cost to the Owner.

## Physical Installation

## All equipment shall be firmly secured in place unless requirements of portability dictate otherwise.

## All equipment shall have an engraved plaque permanently affixed, denoting its function.

## Fastenings and supports shall be adequate to support their loads with a safety factor as per AHJ. All boxes, equipment, etc., shall be secured plumb and square.

## Projectors, lenses, and mirrors shall be solidly mounted and braced or isolated, so that there is no observable movement in the image induced by motor vibration or other mechanical operations at the intended minimum viewing distance.

## In the installation of equipment and cable, consideration shall be given not only to operational efficiency, but also to overall aesthetic factors.

## All overhead equipment must have security cables attached to the building structure to assist in the prevention of loss as required by building code.

## Finishes, Trim and Escutcheon Components

## To insure a proper finished appearance, the AV Contractor shall furnish and install trim/escutcheon components at all conditions where A/V components pass through the finished ceilings. This would include but not be limited to video projector supports, television monitor/receiver supports and any other component which is not specifically supplied with integral flanges/trim components; i.e. speaker mounts, assistance listening devices, etc.

## The visible component of any trim should be minimal in size, preferably no wider than 1/2”. All trim components at the ceiling plane shall be finished to match the approved ceiling finish. The audiovisual contractor should obtain a sample from the General Contractor, including any custom color information, or standard color numbers.

## All visible components and finish options shall be submitted to the Design Team for review and approval prior to fabrication.

## Raceway Systems and Cable Installation

## All wire bundles are to be neat and combed free of cable crossovers.

## All cables, regardless of length, shall be marked with a permanent, self-laminating wrap-around number or letter cable marker at both ends, similar to the Panduit “Pan-Code” system. Labels must be computer-generated for legibility. Wire labels done by hand in the field must be replaced with computer generated labels. There shall be no unmarked cables at any place in the system. Marking codes used on cables shall correspond to codes shown on drawings and or run sheets.

## All cables shall be grouped according to the signals being carried. In order to reduce signal contamination, separate groups shall be formed for the following cable families:

## Power cables

## Control cables

## Video cables

## Audio cables carrying signals less than – 20 dBm

## Audio cables carrying signals between – 20 dBm and +20 dBm

## Audio cables carrying signals above +20 dBm

## As a general practice, all power cables, control cables, and high level cables shall be run on the left side of an equipment rack as viewed from the rear. All other cables shall be run on the right side of an equipment rack, as viewed from the rear.

## Cables ties shall be placed at appropriate intervals of no greater than six inches for vertical bundles, two inches for horizontal bundles.

## All vertical cable bundles shall be attached to the rack frame.

## All cables shall be continuous lengths without splices. All system wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. Except where noted otherwise in the specifications, NO BARE WIRE TERMINATIONS WILL BE ACCEPTED. Heat-shrink tubing shall be used to insulate the ground or drain wire. Unused wires at the end of a cable shall remain unstripped and shall be laid back and held in place with wire ties.

## All solder connections shall be made with rosin-core solder using temperature-controlled solder stations. Care shall be taken to avoid cold or cracked solder joints. Any connections that do not appear to be clean and shiny, or which show signs of cracking, shall be resoldered by the contractor before final acceptance of the system.

## Mechanical connections using insulated, crimp-type connectors shall be bonded to the connector by soldering the wire to the metal part of the connector.

## Connections made with screw actuated pressure type terminal strips shall be made by stripping approximately 1/4 inch of insulation from the stranded conductor. Then the un-tinned wire shall be inserted into the terminal and the screw tightened using a secure fitting precision screwdriver.

## Terminal blocks, boards, strips or connectors shall be furnished for all cables which interface with racks, cabinets, consoles, or equipment modules. No audio cables shall run directly to the audio patch panel jacks. Each audio patch panel shall be furnished with an audio terminal block, and all audio cables to and from the audio patch panel shall terminate on this block.

## All wire markers shall face a common direction.

## All cables shall have proper connector housing.

## Cables shall not protrude from the back of racks.

## All cable entry shall be through the tops of racks or through entrance holes in the base of the rack. No cable shall enter racks through front, rear or side panel openings.

## Unless otherwise called for in these specifications and drawings, the following cables, or their approved equals, shall be used in these systems:

|  |  |  |  |
| --- | --- | --- | --- |
| **Type** | **Manufacturer** | **Non-Plenum** | **Plenum** |
| RF-CATV (Horizontal-RG6) | Belden | 1189A | 1189P |
| RF-DBS/DSS (Horizontal-RG6) | Belden | 1829A | 1829P |
| RF-CATV (Vertical-RG11) | Belden | 1617A/7731 | 1153A |
| RF-50 Ohm (Horizontal RG-8) | Times Microwave | Microwave | LMR400 |
| Video (Baseband & SDI) | Belden | 1505A | 1506A |
| S-Video | Belden | 1807A | 7700A |
| Control (4 conductor shielded) | Belden | 1502R | 1502P |
| Control (12 conductor shielded) | Belden | 9556 | 6309FE |
| Audio | Belden | 9451/1266A | 9451P |
| Audio (8 Ohm program speakers) | Belden | 8473 | 1861A |
| Audio (70 Volt Speaker) | Belden | 8461 | 1863A |
| Video, RGB (RG6) | Belden | 7721A | None |
| Video, RGB (RG59) | Belden | 7796A | 1826A |
| Multi-Channel Audio | Belden | 8774 | 88778 |
| Digital Audio (110 Ohm) | Belden | 1800B | 1801B |
| 4-Fiber Riser Cable |  |  |  |
| Tight-Buffered 50 µm multimode (OM3) | Corning Cable Systems |  | 004T88-31180-29 |
| Category 6e | Berk-Tek |  | LANmark-1000 Enhanced Category 6 UTP |
| Category 6 | Berk-Tek |  | LANmark-6 CAT 6 UTP Plenum |
| Category 5e | Berk-Tek |  | LANmark-350 Prem. Cat 5e |

## Note: These cable types are cited to illustrate the type and quality of cable required. Unless otherwise noted, cables from other manufacturers, i.e. Canare, CommScope, Extron, Gepco, Liberty, etc. will be considered if data sheets indicating equivalency are submitted to Consultant for approval prior to installation.

## It is the responsibility of the Audiovisual Contractor to verify, furnish and install the correct CATV cable type and connectors, as per the local CATV provider.

## Unless otherwise noted, all video and computer video cables are to be terminated using seventy-five ohm (75 Ohm) connectors, with a captive center pin.

## All cables that can be terminated in the field (except video and pulse cables, which must be cut to an electrical length) shall be cut to the length dictated by the run. No splices shall be permitted in any pull boxes without prior permission of the Consultant. For equipment mounted on casters, in drawers or on slides, the interconnecting cables shall be provided with a service loop of appropriate length.

## No cable shall be installed with a bend radius less than that recommended by the cable manufacturer.

## Where cables are visible, the cables will be sheathed in a color wrap that has been submitted for approval by the Design Team.

## Connection Plate Receptacles unless otherwise specified

## Audio (microphone or line level) – XLR type.

## Audio (loudspeaker level) – Neutrik Speakon®.

## Intercom – XLR or ¼ inch diameter tip/ring/sleeve type, or as required by the intercom system. Jack shall be insulated from panel type.

## Video – BNC type.

## VGA – DB-15HD jack, isolated from panel type, with hex nuts.

## RF – “F” type. Receptacles shall be insulated from panel type.

## DVI (Inclusive of DVI-A, DVI-I and DVI-D signal types) – DVI-I type connector unless otherwise specified.

## HDMI – HDMI with locking nut.

## USB – USB Type A

## Category 5/6 – RJ45 Type

## Note: All connectors on wall plates, or in other exposed locations, are to be recessed.

## Patch Panel Assignments

## All patch panels shall be wired so that signal “sources” (outputs from) appear on the upper row of a row pair; and all “loads” (inputs to) appear on the lower row of a row pair.

## Patch Panel Designation Strips

## All audio and video patch panel designation strips shall utilize alphanumeric identifications and descriptive information. The jack position in each horizontal row shall be numbered sequentially from left to right. The horizontal jack rows shall be lettered sequentially from top to bottom. The alphanumeric identification of each jack shall be included on the functional block drawings, as well as on reproductions of these drawings, which shall be mounted in an appropriate location near the patch bays.

## Maintaining Ground Integrity

## In order to minimize problems resulting from improper grounding, and to achieve maximum signal-to-noise ratios, the following grounding practices shall be adhered to in order to maintain the integrity of the grounding system:

## General

## Because of the great number of possible variations in grounding systems, it shall be the responsibility of the Contractor to follow good engineering practice, as outlined below, and to deviate from these practices only when necessary to minimize crosstalk, ground loops, ground-induced noise, and to maximize signal-to-noise ratios in the audio, video, and control systems.

## System Power Ground: A single primary “system ground” shall be established for the system in each particular area. All grounding conductors in that area shall connect to this primary system ground.

## The system ground shall be provided at the audio equipment rack for the area, and shall consist of a copper bar of sufficient size to accommodate all secondary ground conductors. A copper conductor having a maximum of 0.1 Ohms total resistance shall connect the primary system ground bar to the nearest approved ground. The Contractor shall be responsible for determining if the metallic conduit is properly electrically bonded to the building ground system.

## Secondary system grounding conductors shall be provided between all racks, audio consoles, and audiovisual system equipment local to the area. Each of these grounding conductors shall have a maximum of 0.1 Ohms total resistance.

## Under no conditions shall the AC neutral conductor, either in the power panel or in a receptacle outlet, be used as a system ground, except as specifically defined by NFPA 70 for bonding.

## Ungrounded equipment with either an inline transformer or a 2-prong plug, shall be bonded to the rack bus bar using #12awg cable.

## Audio Cable Shields

## All audio cable shields shall be grounded at one point only. There are no exceptions. For inter and intra-rack wiring, this requires that the shield be connected at one end only. For ungrounded portable equipment, such as microphones, the shield shall be connected at both ends but grounded at only one end.

## Video Receptacles

## All video receptacles that are provided and installed by the Contractor shall be insulated from the mounting panel, outlet box, or wireway. Unless otherwise detailed herein, this shall be accomplished by using insulated-from-panel type receptacles.

## Audio Receptacles

## All audio receptacles that are provided and installed by the Contractor shall be insulated from the mounting panel, outlet box, or wireway. Unless otherwise detailed herein, this shall be accomplished by using insulated-from-panel type receptacles.

## General System Performance Standards

## Unless restricted by the published specifications of a particular piece of equipment, or unless otherwise required under the Detailed Specifications, the following performance standards shall be met by each system. The signal paths for the above Performance Standards shall be as follows: From all source inputs to all signal destinations. See Contractor System Checkout Section III-T for testing procedures.

## Analog Audio

Frequency Response Within plus or minus 0.5dB, 20 Hz to 20,000 Hz

Signal to Noise Ratio greater than 90dB  
(including crosstalk and hum at  
all input/output levels)

Total Harmonic Distortion 0.05% maximum from 20 Hz to 20,000 Hz.

Input Levels

Microphone (Nominal) -50dbu

Overload (Minimum gain) -5dbu

Maximum Gain -26dbu

Line (Nominal) +4dbu

Overload (Minimum gain) +24dbu

Maximum Gain +9dbu

Input Common Mode Rejection >100db

Output Levels

Line (Nominal) +4dbu

Maximum +24dbu

Output Impedance < 0.5 Ohms

Load Impedance >150 Ohms

## Analog Video (signal)

Frequency Response Within plus or minus 0.5dB, DC to 4.2 MHz

Signal to Noise Ratio 55 dB minimum  
(peak to RMS) unweighted,  
DC to 4.2 MHz

Crosstalk 45 dB minimum  
unweighted DC to 4.2 MHz

Line and Field Tilt: 2% maximum

Differential Gain: 3% maximum

Differential Gain: 2 degrees maximum

## SDI – Per SMPTE 259M

## HD SDI – Per SMPTE 292M

## HD SDI (Dual Link) – Per SMPTE 424M

## 3G SDI – Per SMPTE 424M

## HDMI – Per HDMI Ver. 1.3b

## DVI – Per DVI Ver. 1.0

## Analog NTSC Video

## COMPOSITE VIDEO SIGNAL

## Signal 1V P-P 75 Ω(3.58, 4.43MHz) NTSC, PAL, or SECAM as appropriate

## S-VIDEO SIGNAL

## Signal Y: 1.0V p-p, 75 ΩC: 0.286V p-p, 75Ω(3.58, 4.43MHz) NTSC, PAL, or SECAM as appropriate

## COMPONENT VIDEO (Beta Component)

## Signal Y: 1.0V p-p, 75 ΩPB/CB: 07V p-p, 75ΩPR/CR: 0.7V p-p, 75 Ω

## RF Broadband

## The RF Broadband system shall meet or exceed the published standards of the following organizations:

## FCC Part 15 Rules and Regulations: Radio Frequency Devices

## FCC Part 76 Rules and Regulations: Cable Television Service

## NCTA-02 Recommended Practices for Measurements on Cable Television Systems.

## Visual Carrier Level +7 +/- 3dBMv for each tap at channel WW(433.25 MHz)

## Visual Carrier Level +5 +/- 3dBMv for each tap at channel 2(55.25 MHz)

## Visual Carrier to Noise Ratio 42 dB minimum on any channel (4MHz bandwidth)

## Maximum Loss from common 45 dB or less point to any tap at channel WW(433.25 MHz)

## Maximum Loss from common 37 dB or less point to any tap at channel 2(55.25 MHz)

## Audio Video Bridging (AVB)

## IEEE 802.1AS: Timing and Synchronization for Time-Sensitive Applications

## IEEE 802.1Qat: Stream Reservation Protocol (SRP)

## IEEE 802.1Qav: Forwarding and Queuing for Time-Sensitive Streams

## IEEE 802.1BA: Audio Video Bridging Systems

## Cobranet Audio

## Audiovisual System, Control System and User Interface Programming

## NYUHC has partnered with PepperDash Technology to develop and implement the standardized Crestron code that will be used throughout the Kimmel Pavilion project. No other Crestron code shall be used unless specified by NYUHC. Bidders are instructed to contact Max Kouznetsov of PepperDash technology at [MKouznetsov@pepperdash.com](mailto:MKouznetsov@pepperdash.com) to obtain the programming package costs.

## Contractor System Checkout

## Before Commissioning Tests are scheduled, the Contractor shall perform his own system checkout based upon an approved testing procedure for the systems. The Contractor shall furnish all required test equipment and shall perform all work necessary to determine and/or modify performance of the system to meet the requirements of this specification. The Contractor shall submit a testing plan (refer to Section III-J.-1.-n) for approval by the individual or firm representing the Owner during the Audiovisual Installation. At a minimum, the following sub-components of the Audiovisual System shall be tested and verified:

## Cable and Connectors

## All cables and connectors shall be tested and verified to comply with the manufacturer’s specifications and design intent.

## Cable test results shall be submitted in advance of the Commissioning for review by the Owner’s Representative.

## Devices

## All devices shall meet the functionality as specified by manufacturer.

## If any device is found to deviate from the manufacturer’s functionality it shall be replaced by the Audiovisual Systems Contractor at no cost to the Owner.

## Signal Types

## The Audiovisual System shall be tested to comply with all video and audio standards as specified in the Performance Standards section and described by the design intent.

## System Function

## The cables and connectors, devices, and signal types shall meet the functional requirements as specified by the design intent.

## Acceptable testing procedures may include but is not limited to that which is described in the detailed specifications such as (streaming, push-to-talk, annotation, etc.)

## Document that all matrix switching crosspoints have been tested and verified.

## Network Cabling

## Refer to Attachment F General Conditions and Cabling Specifications

## Test all audio and video systems for compliance with the Performance Standards, using the example procedure outlined in appendix A:

## Test Equipment. The following test equipment (or submit equivalent for approval) shall be used to test the systems on site.

## Video Testing:

## Video, Component, RGBS, RGBHV and Digital video signal generator, Extron VTG 400 DVI

## Digital Video test generator with EDID and HDCP components, PureLink HDG-8000 PRO

## Media and portable hardware (i.e laptop) representative of all types found in the subject system including but not limited to Blu-ray ™ players and discs (provide discs with and without HDCP encrypted content), mobile PC/Tablets.

## RGB cable, Extron BNC-5-6’HR

## Video cable

## Set of terminations, ‘T’ pieces etc.

## Audio Testing:

## Time based measurement system, Goldline TEF20 or SIA Smaartlive with laptop PC, calibrated omnidirectional mic, and appropriate intefaces

## Audio test set, Audio Precision ATS-1DD

## Media representative of all types found in the subject system

## Audio cables as required to connect test equipment to the system

## Set of terminations, adapters etc.

## Gain Setting

## Adjust all systems (end to end within a system) for maximum signal-to-noise ratio. No hiss should be audible through any loudspeaker at the completion of gain structure setting, and all audio gain stages should clip simultaneously.

## Signal Paths

## Video/Audio

## Connect the output of the video signal generator to a floor box/table/rack connector and select the “Full Field Color Bar” signal. Connect the combined waveform monitor/vectorscope to a final output point, e.g. an input to a picture monitor or video projector. Ensure that the test signal is routed to the selected output.

## Measure and record the signal amplitudes.

## Repeat item ‘i’ after selecting the “Multiburst, 50 IRE” test signal.

## Measure and record the signal amplitudes.

## Repeat item ‘i’ after selecting the “Modulated 5-step” test signal.

## Measure and record the signal differential phase and gain.

## Repeat item #’s ‘i’ through ‘vi’ for other video signal paths.

## Repeat item ‘i’ after selecting the Window test signal.

## Measure and record the signal line and field tilt.

## Repeat item ‘i’ after connecting the Black Burst signal from a rear mounted connector.

## Measure and record the signal/noise ratio.

## Connect the output of the audio test set to a floor box/table/rack program audio connector and connect the input of the audio test set to a final output point, e.g. an input to a program speaker power amplifier. Ensure that the test signal is routed to the selected output, that the volume control is set to 100% and that the equalizers are bypassed.

## Measure and record the signal/noise ratio, total harmonic distortion and frequency response.

## Repeat items ‘xii’ and ‘xiii’ for other audio signal paths.

## Connect the output of the audio test set to a floor box/table/rack speech audio connector and connect the input of the audio test set to a final output point, e.g. an input to a speech speaker power amplifier. Ensure that the test signal is routed to the selected output, that the volume control is set to 100% and that the equalizer is bypassed.

## Measure and record the signal/noise ratio, total harmonic distortion and frequency response.

## Repeat items ‘xv’ and ‘xvi’ for other audio signal paths.

## RGB

## Connect the RGB output of the signal generator to a floorbox/table/rack connector and select the SMPTE & PLUGE signal at the various computer scan rates as follows:

* 640 x 480 31.5kHz H, 60Hz V
* 640 x 480 37.5kHz H, 75Hz V
* 800 x 600 38kHz H, 60Hz V
* 832 x 624 49.7kHz H, 75 Hz V
* 1024 x 768 48kHz h, 60Hz V
* 1280 x768 48kHz H, 60 Hz V
* 1280 x 1024 64kHz H, 60Hz V
* 1366 x 768 48 kHz H, 60hz V
* 1400 x 1050 63.9 kHz H, 60 Hz V
* 720p 45 kHz H, 60 Hz V
* 1080i 33.75 kHz H, 60 Hz V
* 1080p 33.75kHz H, 24 Hz V
* 1080p 33.75kHz H, 30 Hz V

## Check that the image is correctly displayed on the picture monitor(s) and/or by the video projector.

## Repeat item ‘ii’ using Crosshatch signal, checkerboard signal and H Pattern signal.

## Repeat item ‘ii’ for other RGB connection locations.

## Connect the output of the audio signal generator to a floorbox/table/rack ‘Left’ and ‘Right’ connectors and select the 1kHz tone. Check that the signal is emitted from the left and right program speakers.

## Repeat item ‘v’ for other audio connection location.

## Note: The term “RGB” is used generically. The system will be tested with the sync format dictated by functional requirements, including, but not limited to, sync-on-green, composite sync and separate horizontal and vertical sync. Whenever possible, include computer sources provided by the Owner, at the desired resolution, in your testing.

At the conclusion of the tests, return all equipment settings to previously calibrated positions.

Provide written records of all test results in spreadsheet form.

Check all control functions, from all controlling devices to all controlled devices, for proper operations.

Adjust, balance, and align all equipment for optimum quality and to meet the manufacturer’s published specifications. Establish and mark normal settings for all level controls, and record these settings in the “System Operation and Maintenance Manual”.

Check all optical projection images for average light level, light fall-off, and image alignment and size to comply with the Performance Standards and specifications drawings. Check to determine that all projectors, projector bases, carts, tables, and mirrors are rigid and vibration-less in operation.

Maintain documentation of all performance tests for reference by the Owner’s Representative during the Commissioning.

## Commissioning Tests

## Commissioning Tests will not be performed until the Contractor’s System Checkout has **been completed and the test results have been reviewed. The Commissioning Tests will** be supervised by the Owner’s Representative and shall consist of the following at a minimum:

## A physical inventory of all equipment on site and will be compared to equipment lists in the contract documents.

## The operation of all system equipment shall be demonstrated by the Contractor.

## Review of final As-Build documentation as described in the “Contractors Documentation” section of this specification.

Both subjective and objective tests will be required by the Owner’s Representative to determine compliance with the specifications. The Contractor shall be responsible for providing test equipment for these tests.

In the event further adjustment is required, or defective equipment must be repaired or replaced, tests may be suspended or continued at the option of the Owner’s Representative.

Any charge for additional time incurred by the Owner’s Representative required to over-see the system tests, due to improper system installation or previous failed systems, shall be the responsibility of, and charged directly to the contractor.

Note: As noted in Section II -C. -10, “Warranty Statement” and Section II -C. -11 “Preventative Maintenance & Service Contract,” Warranty and Preventative Maintenance Periods shall commence after final commissioning by both the Owner and Consultant.

# RFP Attachments

* Exhibit A: Equipment List and -Price Sheet
* Exhibit B: Reference Instructions
* Exhibit C: Contractor Qualification Questionnaire
* Exhibit D: 360 Park Ave. South Audio Visual Diagrams
* Exhibit E: Agreement
* Exhibit F: Work order ( Final document will be provided shortly)
* Exhibit G: Division 27 Cabling Specification
* Exhibit H: Addendum Acknowledgement Form
* Exhibit I: Drawing List