CITY COUNCIL AGENDA ITEM
CITY OF SHORELINE, WASHINGTON

AGENDA TITLE:	Authorize the City Manager to Execute a Contract with AVI-SPL in the Amount of $370,039.05 for City Hall Video Conferencing Upgrade
DEPARTMENT:	Administrative Services Department
PRESENTED BY:	Karen Mast, Information Technology Manager
ACTION:	____ Ordinance ____ Resolution _X_ Motion ____ Discussion ____ Public Hearing

PROBLEM/ISSUE STATEMENT:
As a result of the COVID-19 pandemic, the way in which business is conducted at the City, and across the nation, has shifted. Since March 2020, the majority of City employees have been working remotely; the City Council, Advisory Boards, and other public meetings have been conducted as fully remote meetings; and previously in-person and paper-based services were converted to online services.

As the City prepares for the full reopening of Shoreline City Hall, technology upgrades are needed in order to allow for meetings with both remote and in-person participation (also known as Hybrid Conferencing). It is an expectation of many in the public that they are able to interact with their government remotely. Additionally, the City is working to develop an updated Remote Work Policy for City staff, which proposed to allow staff to continue to work remotely for a portion of their work week. The existing computer and audio/visual hardware in City Hall does not allow for quality Hybrid Conferencing, and a technology upgrade is needed to allow the public and staff to work in a hybrid conference format.

Tonight, staff is seeking Council authorization for the City Manager to execute a contract with AVI-SPL in the amount of $370,039.05 to provide an upgraded video conferencing system to allow for Hybrid Conferencing.

RESOURCE/FINANCIAL IMPACT:
The cost for upgrading the City's video conferencing technology is $370,039.05. This includes engineering and design, pre-installation, on-site installation, commissioning, testing and adjustments, training and a one-year maintenance and service agreement for on-call assistance. The cost for this project was not budgeted for in the 2021-2022 Biennial Budget and will be included in the 2021-2022 Mid-Biennial Budget update to be presented to Council in November. Funding to support the purchase will come from either General Fund fund balance (fund balance) or use of the $500,000 American Rescue Plan Act (ARPA) funding allocated to support City costs associated with responding to recovery from the Pandemic. At this time, staff estimates that the total City costs that would be eligible for use of ARPA funding will exceed the $500,000

currently allocated to this area. Staff are monitoring these costs and the City Manager will evaluate whether to recommend that Council consider increasing the allocation of ARPA funding to this area and decreasing other allocations, or utilizing fund balance to support these costs.

RECOMMENDATION

Staff recommends that the City Council move to authorize the City Manager to execute a contract with AVI-SPL for audiovisual solution design, engineering, equipment, and installation to support hybrid video conferencing at City Hall in the amount of $370,039.05.

Approved By: City Manager *DT*   City Attorney *MK*

INTRODUCTION

The City's current audio video infrastructure within conference rooms and the Chamber does not adequately allow for a quality meeting experience when attendance is a mix of in-person and remote participants. This fall, City staff will be returning to the office, with the likely continuance of some ongoing remote work. It is an expectation of the public that they will be able to continue to conduct business and participate in meetings remotely and have the option to participate in person. In order to ensure the City is ready to accommodate hybrid communication and collaboration, we need to upgrade our audio video technology in the Council Chamber and in high-usage conference rooms at City Hall. Staff recommends that Council authorize the City Manager to enter into a contract with AVI-SPL to perform this work to outfit our Council Chambers and select conference rooms for in-person and remote participation.

BACKGROUND

Council last discussed post-pandemic Council meetings and public participation at its Goal Setting Workshop in March 2021. In this discussion, Council agreed that online meetings have been very successful and productive but expected that Council would return to in-person meetings when safe to do so. Council also noted that the virtual environment allowed for more public engagement and desired to see ongoing opportunity for the public to participate in public meetings both in person and online. Council was supportive of staff and Councilmembers participating in Council meetings remotely, as needed.

City staff have also had to adapt to remote work and meetings. Again, this has been seen as successful and productive. As the City and Council return to in-person meetings with a continued desire to allow for remote participation, City staff have expressed a need for Hybrid Conferencing capability.

DISCUSSION

With this direction, staff began researching and evaluating technology improvements to allow for quality hybrid meeting experiences. The City's requirements were to identify a solution that allows all in-person and remote meeting attendees to see, hear, and share displays with each other simultaneously. The technology needs to be easy to use, with the same user interface in each meeting room. Staff engaged two vendors who conducted remote consultations, site visits, and subsequently submitted work proposals. Both vendors proposed similar solutions for the Council Chamber and conference rooms. AVI-SPL is the vendor that recommended a holistic approach that not only installs new equipment to make hybrid meetings possible, but also upgrades the City's aging audio video infrastructure to meet our technology needs for the future.

AVI-SPL's proposal (Attachment A) includes a tabletop touchpad device with integrated cameras and microphones in all rooms, and upgraded LCD displays or projectors, where necessary. Each hybrid room will also have a digital calendar display near the entrance to show room availability and allow for ease of scheduling. In the Council Chamber, in addition to hybrid meeting capabilities, the microphone system for in-person meetings will be reworked and the current dais microphones will be

reprogrammed to improve quality. The room will be equipped with assisted listening devices to achieve compliance with 2010 ADA guidelines, and the retrofit will include an upgrade to the control room equipment, furniture, and general systems wiring to bring a greater level of production and systems control. AVI-SPL will procure and install the hardware, program the system, perform testing, and conduct training on the devices. The contract also includes an annual maintenance and service agreement for on-call assistance for the A/V hardware.

The proposed projects include the Council Chamber; four (4) medium sized conference rooms, two (2) large conference rooms, and two (2) training rooms. Following is a breakdown of price for each space:

Council Chambers	$139,000
Medium Rooms	$16,000
Large Rooms	$22,000
Training Rooms	$42,000

Staff will use a cooperative purchasing agreement to purchase equipment and services as these purchasing options historically provided the best value for the City. The cooperative purchasing agreement is through OMNIA Partner (US Communities, #7968) for Audio Visual Goods - Contract Number 2019.001535, and AVI-SPL has provided pricing based on this contract.

The City has participated in discussions with other agencies and learned that many are in the same situation, seeking technology upgrades to allow for hybrid conferencing. The cost of the technology investment varies across agencies depending on existing equipment and desired outcome. Allowing for remote public participation increases community engagement and efficiency for our customers. Allowing remote work improves employee productivity, increases employee satisfaction, and helps attract and retain a diverse and talented workforce. A necessary component of building a successful hybrid workplace is to upgrade the technology for a quality hybrid conference experience.

If the City does not move forward with upgrades, the City's ability to provide quality hybrid video conferencing for employees, Council and boards, and the public will be compromised. Additionally, high vendor demand and global chip shortages for electronic equipment could affect the City's timeline for installation. Currently, the City is aiming to implement this solution by the fall of 2021.

RESOURCE/FINANCIAL IMPACT

The cost for upgrading the City's video conferencing technology is $370,039.05. This includes engineering and design, pre-installation, on-site installation, commissioning, testing and adjustments, training and a one-year maintenance and service agreement for on-call assistance. The cost for this project was not budgeted for in the 2021-2022 Biennial Budget and will be included in the 2021-2022 Mid-Biennial Budget update to be presented to Council in November. Funding to support the purchase will come from

either General Fund fund balance (fund balance) or use of the $500,000 American Rescue Plan Act (ARPA) funding allocated to support City costs associated with responding to recovery from the Pandemic. At this time, staff estimates that the total City costs that would be eligible for use of ARPA funding will exceed the $500,000 currently allocated to this area. Staff are monitoring these costs and the City Manager will evaluate whether to recommend that Council consider increasing the allocation of ARPA funding to this area and decreasing other allocations, or utilizing fund balance to support these costs.

RECOMMENDATION

Staff recommends that the City Council move to authorize the City Manager to execute a contract with AVI-SPL for audiovisual solution design, engineering, and installation to support hybrid video conferencing at City Hall in the amount of $370,039.05.

ATTACHMENTS

Attachment A – AVI-SPL Video Conferencing Upgrade Scope of Work

AVI-SPL Solution Scope of Work

After careful and deliberate consideration of your requirements, we are pleased to provide the following audiovisual solutions Scope of Work. The scope of work noted is based on sound engineering principles, reliable technology, and have been formulated specifically to meet your requirements.

All pricing for the below systems is based upon the AVI-SPL OMNIA contract # 2019.001535.

Project Overview

This project includes the AV retrofit and upgrade of the council chamber core systems as well as the addition of video teleconferencing to multiple locations.

AVI-SPL is offering a solutions package designed to maximize the City of Shoreline's investment in Microsoft technology; specifically, the Teams collaboration platform. To achieve this goal, AVI-SPL is utilizing certified Microsoft Teams Room solutions wherever possible. In some situations, AVI-SPL has substituted individual components, or augmented the Microsoft standards with other products, to enhance operating performance, or to meet specific customer requirements. These spaces will also be outfitted with a USB cable to allow the systems to operate in a bring your own device (BYOD) mode and conference on third party platforms such as Zoom if required. Room scheduling touch panels outside of each conference space will tie seamlessly into Office 365 for a collective one touch to join experience.
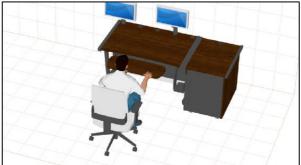
Each engineered solution is intended to register directly to City of Shorelines hosted Microsoft environment, and as such, will require the assistance of IT administrative resources to properly provision and deploy accounts and licensing. Specific requirements will be outlined later in this document. Please review customer requirements that will be required for delivery of this project. Additional cost impact or additional labor charges may be proposed should unscheduled site visits be required.

Council Chambers & Control Room

Design Narrative

The Council Chambers will be provided with several system improvements and new pieces of equipment to facilitate the addition of video teleconferencing. New features will include a wireless iPad located in both the council chambers and the control room. These touch panels with a revised graphical user interface will act as a room feature control panel for the council chambers. A second teleconferencing touch panel will be located within the council chambers to place and receive video teleconferencing calls. Council members will be able to wirelessly share video to a new wireless presentation gateway from Windows, Android, or iOS devices. All existing delegate microphones will be supported by an upgraded audio DSP and audio systems will be recommissioned by an audio engineer for conference calls and local presentations. The upgraded audio DSP will enable new features such as new audio record inputs/outputs, audio monitoring features for the control room, and the ability to expand the audio system in the future if required via AVB or Dante based technology. The owner will provide an updated assisted listening system for integration. Part of this retrofit will also include an upgrade to the control room equipment, furniture, and general systems wiring to bring a greater level of production and systems control to the control room.

Programming and training coordination will be provided as part of this response for quotation.

Scope of Work – Hardware Integration

Hardware installation and general functionality or specifications. Equipment to be provided and installed by AVI-SPL unless otherwise specified.

Display(s)

The following display devices will be integrated into the system:

- Qty 1, OFE (owner furnished equipment) video projector for displaying video content within the space.
- Qty 1, OFE recess mounted, motorized operation, projection screen.
- Qty 1, OFE Vaddio touch production monitor.
- Qty 1, OFE Totevision dual display Program, Preview, Content, SMP production monitor.
- Qty 8, OFE Totevision dais monitors.
- Qty 1, new Viewsonic 24" production monitor. This monitor will be used in conjunction with a KVM switch to display either the output of the video edit PC or the Granicus content record PC.

Source Equipment and Interfaces

The following sources will facilitate end user laptop connections:

- Qty 3, OFE HDMI connections located at the council chambers table for laptop connectivity.
- Qty 1, new USB-C connection located at the council chambers table for laptop connectivity.

Under-table interface boxes will route compatible video signals into the system. Connectivity to these devices shall be made via existing table pass through grommets or dressed along the side of the table.

The following source devices will be integrated into the system:

- A wireless presentation gateway, located at the dais.
- An existing graphics pc will be routed to the production controller.

Routing and Switching

The following video routing and switching devices will be integrated into the system:

- A video matrix switcher located in the equipment rack. The matrix switcher will route all video signals and embedded audio throughout the system.
- A secondary video matrix switcher located atop the production desk in a rack. This matrix switcher will manually route program, preview, content, or SMP video feeds to the Totevision dual display.
- A KVM switcher located atop the production desk in a rack. This KVM switcher will manually route the output of the video edit PC or the graphics PC to the new Viewsonic production monitor.
- A OFE Vaddio Production View HD-SDI MV controller and Teletouch 22 located atop the production desk. This MV controller will manually route the output of the five cameras to the core of the switching system. Input six will be revitalized and scheduled to take in the graphics pc so lower screen graphics may once again be utilized with the system. The existing pc has a VGA output and it is recommended that pc with an HDMI output is procured by the owner per manufacturer recommendation.

Audio

The following audio devices will be integrated into the system:

- A digital signal processor (DSP) will support all audio sources. All microphones used for conferencing shall utilize a dedicated acoustical echo canceling (AEC) channel per microphone element in the DSP. See the Conferencing section for more detailed information regarding audio or video conferencing.
- Microphones will support conferencing and other system features. The following microphone(s) will be used to provide speech audio to conference calls. The microphone(s) will support local voice reinforcement within the room.
    - Qty 2, New Lavalier wireless microphone(s).
    - Qty 2, New Handheld wireless microphone(s).
    - Qty 1, Existing Dais wired microphone system(s).
    - Qty 4, Existing Gooseneck wired microphone(s).
    - Qty 1, Existing Gooseneck wired microphone(s).
        - Qty 1, new Microphone charging station.
- Existing ceiling speakers will support playback of program and conferencing audio.
- Studio Monitors, located behind the production desk, will support production audio as required.
- Audio I/O plates in the production control room will include a Bluetooth audio receiver, two xlr inputs, one 1/8" L/R input, one RCA L/R input, one 1/8" L/R output, Two xlr record outputs, two xlr studio monitor outputs, and one ¼" headphone output. This I/O will be optimized to make sure audio recording, monitoring, and system audio inputs are as flexible as needed.

Conferencing

The following conferencing devices will be integrated into the system:

- A Microsoft Teams Room small form factor PC will register to the Customer's Microsoft Teams environment. All audio and video conferencing operations will be managed by this device. Available features will depend on system licensing options provided by the Customer.
- USB audio and video connections will facilitate Bring Your Own Device (BYOD) conferencing for user laptops. The signals for these devices will be connected to a USB hub that provides a single USB connection to the user. Conference room visitors can connect their laptop to the USB connection to use their own UC conference platform. The room system will automatically switch to the connected laptop's UC platform and then returns to the native Microsoft Teams Rooms platform when disconnected. Only one of these conferencing options, BYOD or Microsoft Teams, may be used at any one time.
- QTY 5 existing high definition cameras will be routed to the Microsoft Teams Room or BYOD connection via the existing video production controller.

Equipment Rack and Accessories

Equipment will be installed in the following locations:

- A new 45 RU free-standing equipment rack will house most racked equipment. The rack will be in the production control room.
- New control furniture will include a 12 RU cabinet equipment rack and a 12 RU desktop mounted equipment rack. The rack will be in the production control room and integrated with the control room furniture.

Control System and Accessories

A control processor will be installed to enable various functions throughout the system. Please refer to the Software Integration section for more detailed information about system control.

- The control processor will be located in the equipment rack.
- A wireless touch screen interface with a 10" screen size will be located at the wall.
- A wired Crestron Flex touch screen interface with a 10" screen size will be located at the wall.
- A wired Crestron Flex touch screen interface with a 10" screen size will be located at the central council chambers table.
- A wireless touch screen interface with a 10" screen size will be located at the production booth table.

Scope of Work – Software Integration – Council Chambers

A control system will be provided to activate many necessary user needs. This greatly reduces the complexities of operating an integrated A/V system and facilitates greater system utilization and an enhanced meeting experience.

User Interface

A user interface will facilitate advanced system operation. The following user interface(s) will be used during conferencing for this system:

- A Microsoft Teams touch screen graphical user interface design will utilize the manufacturer's out of the box application or interface. Please reference the manufacturer's interface guide for an example layout.
- The interface layout and control features are provided and supported by the manufacturer and may change without notice.

A control processor will be repurposed to enable various functions throughout the system. The control processor will be located in the equipment rack.

- A wired touch screen interface with a 10" screen size will be located at the production control room operator's station and on the wall within the council chambers.
- Our team has allocated hours towards the creation and implementation of the control system. Those hours include:
  - Programming:
    - Video
      - Configuration of Source and Destination Routing Matrix Revising System for Current I/O
      - Addition of Wireless Presentation Gateway as a Source
      - Addition of VTC Display Output as a Source
      - Addition of VTC Content Ingest as a Destination
      - Addition of Mirrored Dais Monitors as a Collective Destination
    - Audio:
      - Program Audio and Microphone Audio
    - System:
      - System Off and On
  - Our team will submit the user interface for approval prior to installation of the programming
  - An owner representative is required to sign-off on the user interface design
  - Commission the system in our test shop
  - Commission the completed system on site
  - Provide touch panel user manuals
- If, upon meeting with the client or their representative and formalizing the programming statement for the system, our team finds that the requirements for programming will be less or more than originally allocated, then we may submit a positive or negative change order prior to completion of the programming for the difference between the allocated and required programming hours.

Medium Conference

Applies to: Council Room C-104, Room 207, Heritage Room 302, & Room 304

Design Narrative

Microsoft Teams Room systems (MTRs) are self-contained presentation and collaboration systems designed to register to, and work directly with, the Microsoft Teams environment within the Microsoft 365 cloud.

All operation of collaboration and room control functions utilizes the provided touch interface. The user interface is a standard program, created and maintained by Microsoft and consistent across all Microsoft Teams conference room clients and devices. This allows users familiar with Microsoft Teams, either on their desktop or mobile device, to easily start and manage meetings with little or no additional training.

Scope of Work – Hardware Integration

This section describes hardware installation and general functionality or specifications. All equipment provided and installed by AVI-SPL unless otherwise specified.

Display(s)

The following display devices will be integrated into the system:

- Qty 1, 85" flat panel display(s) for displaying video content within the space.
  - Display(s) will be wall mounted in the location(s) specified in the project drawing package.

Source Equipment and Interfaces

The following sources will facilitate end user laptop connections:

- Qty 1, HDMI and USB connection(s) located at the table for laptop connectivity.

Audio

The following audio devices will be integrated into the system:

- A USB speakerphone will support conferencing audio.

Conferencing

The following conferencing devices will be integrated into the system:

- A Microsoft Teams Room small form factor PC will register to the Customer's Microsoft Teams environment. All audio and video conferencing operations will be managed by this device. Available features will depend on system licensing options provided by the Customer.
- USB audio and video connections will facilitate Bring Your Own Device (BYOD) conferencing for user laptops. Conference room visitors can connect their laptop to the USB connection to use their own UC conference platform. The room system will automatically switch to the connected laptop's UC platform and then returns to the native Microsoft Teams Rooms platform when disconnected. Only one of these conferencing options, BYOD or Microsoft Teams, may be used at any one time.
- QTY 1 high definition camera will be routed to the Microsoft Teams Room or BYOD connection.

Equipment Rack and Accessories

Equipment will be installed in the following locations:

- All equipment will be mounted on the wall behind the display.

7e-11

Large Conference

Applies to: Training Room 440 & Watershed Room 222

Design Narrative

Microsoft Teams Room systems (MTRs) are self-contained presentation and collaboration systems designed to register to, and work directly with, the Microsoft Teams environment within the Microsoft 365 cloud.

All operation of collaboration and room control functions utilizes the provided touch interface. The user interface is a standard program, created and maintained by Microsoft and consistent across all Microsoft Teams conference room clients and devices. This allows users familiar with Microsoft Teams, either on their desktop or mobile device, to easily start and manage meetings with little or no additional training.

Scope of Work – Hardware Integration

This section describes hardware installation and general functionality or specifications.

Display(s)

The following display devices will be integrated into the system:

- Qty 1, 98" flat panel display(s) for displaying video content within the space.
  - Display(s) will be wall mounted in the location(s) specified in the project drawing package.

Source Equipment and Interfaces

The following sources will facilitate end user laptop connections:

- Qty 1, HDMI and USB connection(s) located at the table for laptop connectivity.

Audio

The following audio devices will be integrated into the system:

- A USB speakerphone will support conferencing audio.

Conferencing

The following conferencing devices will be integrated into the system:

- A Microsoft Teams Room small form factor PC will register to the Customer's Microsoft Teams environment. All audio and video conferencing operations will be managed by this device. Available features will depend on system licensing options provided by the Customer.
- USB audio and video connections will facilitate Bring Your Own Device (BYOD) conferencing for user laptops. Conference room visitors can connect their laptop to the USB connection to use their own UC conference platform. The room system will automatically switch to the connected laptop's UC platform and then returns to the native Microsoft Teams Rooms platform when disconnected. Only one of these conferencing options, BYOD or Microsoft Teams, may be used at any one time.
- QTY 1 high definition camera will be routed to the Microsoft Teams Room or BYOD connection.

Equipment Rack and Accessories

Equipment will be installed in the following locations:

- All equipment will be mounted on the wall behind the display.

Training Room

Applies to: Legacy Room 303 & Neighborhood Room 301

Design Narrative

Microsoft Teams Room systems (MTRs) are self-contained presentation and collaboration systems designed to register to, and work directly with, the Microsoft Teams environment within the Microsoft 365 cloud.

All operation of collaboration and room control functions utilizes the provided touch interface. The user interface is a standard program, created and maintained by Microsoft and consistent across all Microsoft Teams conference room clients and devices. This allows users familiar with Microsoft Teams, either on their desktop or mobile device, to easily start and manage meetings with little or no additional training.

Scope of Work – Hardware Integration

This section describes hardware installation and general functionality or specifications. All equipment provided and installed by AVI-SPL unless otherwise specified.

Display(s)

The following display devices will be integrated into the system:

- Qty 1, video projector for displaying video content within the space. The projector shall have a native resolution of 1920X1200 pixels.
- Qty 1, existing surface mounted, motorized operation, projection screen.
    - A manufacturer low voltage wall switch shall be provided with each motorized projection screen for operation.

Source Equipment and Interfaces

The following sources will facilitate end user laptop connections:

- Qty 1, HDMI and USB connection(s) located at newly provided presentation lectern for laptop connectivity.

Audio

The following audio devices will be integrated into the system:

- A digital signal processor (DSP) will support all audio sources. All microphones used for conferencing shall utilize a dedicated acoustical echo canceling (AEC) channel per microphone element in the DSP. See the Conferencing section for more detailed information regarding audio or video conferencing.
- Microphones will support conferencing and other system features. The following microphone(s) will be used to provide speech audio to conference calls. The microphone(s) will not support in-room voice reinforcement.
    - Qty 1, Ceiling mounted array microphone(s).
- Qty 6, ceiling speakers will support playback of program and conferencing audio.

Conferencing

The following conferencing devices will be integrated into the system:

- A Microsoft Teams Room small form factor PC will register to the Customer's Microsoft Teams environment. All audio and video conferencing operations will be managed by this device. Available features will depend on system licensing options provided by the Customer.
- USB audio and video connections will facilitate Bring Your Own Device (BYOD) conferencing for user laptops. Conference room visitors can connect their laptop to the USB connection to use their own UC conference platform. The room system will automatically switch to the connected laptop's UC platform and then returns to the native Microsoft Teams Rooms platform when disconnected. Only one of these conferencing options, BYOD or Microsoft Teams, may be used at any one time.
- QTY 1 high definition camera will be routed to the Microsoft Teams Room or BYOD connection.

Equipment Rack and Accessories

Equipment will be installed in the following locations:

- All equipment within will be mounted in a mobile AV equipment rack located beside the desk of choice within the space. The rack will be semi-permanently affixed to the wall with patch cabling and will be wired on a movable loom for service and accessibility.

Scope of Work – Software Integration – Small Conference, Medium Conference, Large Conference, Training Room

A control system will be provided to activate many necessary user needs. This greatly reduces the complexities of operating an integrated A/V system and facilitates greater system utilization and an enhanced meeting experience.

User Interface

A user interface will facilitate advanced system operation. The following user interface(s) will be used during conferencing for this system:

- A Microsoft Teams touch screen graphical user interface design will utilize the manufacturer's out of the box application or interface. Please reference the manufacturer's interface guide for an example layout.
- The interface layout and control features are provided and supported by the manufacturer and may change without notice.

Infrastructure

- Video wall panels and AV equipment will produce an excess of heat and AVI-SPL will provide these metrics during project coordination in the form of BTU/hr. Cooling must be accounted for via an active or convection-based cooling solution located within the spaces
- AV equipment will require various power, data drops, and general conduit pathway to make these spaces video teleconference ready. AVI-SPL will provide power and data locations during project coordination which shall be provided by others.
- AV equipment may require the relocation of existing marker boards or patching and painting of wall locations which shall be provided by others.
- Display walls shall need to be properly backed and verified by a certified PE to withstand the weight of the display in each location to a safety factor of at least 5:1.
- A sightline study or review shall be performed post award in conjunction with the owner, architect, consultant, and client to verify all project metrics and video wall design.

Network and Network Security

The integration of Audio-Visual hardware can consist of many different devices and systems, each with varying network requirements, impacts to traffic and routing, and unique management and security processes. AVI-SPL will work with the City of Shoreline identified stakeholders to properly assess network requirements and deployment considerations.

AVI-SPL will design the system to meet identified network requirements and will provide construction drawings and a list of devices before installation on site. At the time of installation, AVI-SPL will connect devices according to the documented system design and identified network requirements. The following network design is being followed for this project:

Hybrid AV/Client Network

Hardware that does not require integration to the client network can be completely isolated from the client network.

- The control system, touch panel, and audio video transport devices that carry Ethernet control reside in their own wired network.
- Hardware that requires integration with the owner network will be connected directly to the owner network. Examples: Microsoft Teams PC soft codecs.

** Please see the "**Customer Responsibilities**" and "**Software Licenses and Service Accounts**" sections of this document for deployment best practices and installation requirements. Additional information regarding specific applicable processes and procedures can be referenced in the "**AVI-SPL Network and Security**" addendum to this document. **

Customer Responsibilities

These are items that AVI-SPL is dependent upon to complete the project scope of work on time, however, these requirements and responsibilities are not provided by AVI-SPL. For a complete list of exclusions, please refer to the Integration Inclusions and Exclusions section of this proposal.

These requirements must be provided by the owner or other 3rd parties and may fall under the responsibility of an Architect, General Contractor, Electrical Contractor, Data Contractor, Security Contractor, Furniture/Millwork Contractor, IT departments, Facilities or Real Estate groups.

- Labor is quoted based on installation being performed on consecutive days during normal business hours.
- All required backing and any other wall reinforcement required to safely accommodate displays. Any display wall shall be properly backed to withstand the weight of the display with a safety factor of at least 5:1.
- All AC power at the equipment locations, including hardwired power connections.
- All required conduit for low voltage cable paths to AV equipment.
- All ceiling work required to accommodate the projectors, projection screens, or other equipment.
- All required millwork modifications to tables or other millwork.
- Proper heat dissipation venting for the equipment in this system. Where convection cooling is not possible, a powered venting system with thermostatically controlled quiet fans.
- All required network configuration for any network connection to the client network.
- All software or hardware licenses not specifically provided in this scope of work or associated bill of materials. Example: iPad touch panels will require end users to create an apple account and associate a payment method with the account to allow for download of free control applications.
- All software or hardware configuration for owner furnished equipment.
- All cable/satellite/over-the-air TV connections and all associated hardware.

Site Readiness

The minimum acceptable site conditions of the project site for the installation of electronic equipment are as follows.

- The rooms and directly adjacent areas into which the equipment will be installed must be dust-free with floor, ceiling, and wall finishes to be completely installed in the rooms affected by the equipment.
- The rooms into which the equipment will be installed must be secure.
- All Electrical power, conduit systems, HVAC systems, IT requirements (wired or wireless services), communication circuits, and or other services required by the systems and equipment should be fully installed, energized, and configured for use.
- All furniture into which components of the equipment will be installed shall be present at the time of staging and/or installation.
- All telephone, POTS, VOIP, modem, PRI, data, LAN, and telecommunications connections are installed, fully tested, and active.
- Configuration of OFE networks, applications, servers, and services to provide interoperation with installed systems.
- Coordination and timely IT support and documentation (such as providing IP addresses or account credentials).

Software Licenses and Service Accounts

Supervised or direct access to systems must be provided as needed for a properly provisioned and licensed account where appropriate. Examples include Zoom Rooms activation codes, Microsoft Teams accounts, calendar service account, and more.

- The customer may decide not to provide credentials to AVI-SPL, and to provision the installed hardware themselves. In this case AVI-SPL will be unable to fully test the system before receiving sign-off for the installation. All system components will be tested individually to ensure proper stand-alone function, and project sign-off will be requested before technicians leave site.
- If AVI-SPL is unable to properly commission and test the system at the time of installation due to issues with access, an additional site visit may be required. Any additional visits will be billed at the standard contracted labor rate, provided Customer is at fault and approves additional cost in advanced and in writing, scheduling will be done on a best effort basis.

Room Environmental Considerations

To maximize the user experience in a conferencing room, the following parameters should be observed:

- The room should have a measured ambient noise level of no more than NC35. For new spaces, the design parameters for the mechanical engineering within the room should have a target NC of 35 or less. Ambient noise includes noise from the air handling systems, mechanical systems and noises outside the building. Noise levels above this specification adversely affects the meeting environment and may degrade the overall audio quality and intelligibility of a conference call. This is especially important when ceiling microphones are utilized. If a problem is identified with ambient noise levels, AVI-SPL can work with your mechanical engineer to identify possible solutions to lower the NC rating and improve the meeting experience.
- Reverberation time (T60) for typical conference rooms should be less than 0.6 seconds in the 125 - 4000 Hz octave bands to provide an optimum meeting experience and acceptable audio quality in a conference call. A significant number of hard surfaces in a room (glass, drywall or other surfaces) can adversely affect audio intelligibility and the meeting experience overall. Acoustic treatment is advised for rooms with higher T60 levels. If the room requires acoustically treatment, AVI-SPL can provide direction and solutions to overcome this issue and enhance the meeting experience for the participants.
- Evenly distributed lighting is important for videoconferencing applications. Lighting on the faces of the participants should be at least 40-foot candles and should be evenly distributed throughout the camera's field of view. Where the camera's field of view includes windows, recommended window treatment should be employed to provide an acceptable background for the camera to view the participants.
- When microphones are used for local voice reinforcement, the amount of available gain before feedback is dependent on the microphone's location within the room. Placement of the microphone immediately below a ceiling speaker may adversely affect the overall required audio level and cause feedback. Care should be taken to reduce the volume level of the microphone or locate the microphone(s) correctly to minimize the possibility of feedback.