SECTION 274116.50 – VIDEO WALL EQUIPMENT AND SOFTWARE FOR SOC

PART 1 - GENERAL

1.1   SUMMARY

A.   Section includes specification of Video wall monitors controller and software.

1.2   PREBID MEETINGS

A.   A pre-bid meeting will be held for a walkthrough of the space on May 09, 2025.

1.3   ACTION SUBMITTALS

A.   Product Data: For each type of product.

    1.   Include construction details, material descriptions, dimensions of individual components and profiles for all video wall monitoring displays, mounts, controllers, wiring and software integration
    2.   Include rated capacities, operating characteristics, electrical and low voltage characteristics, and furnished specialties and accessories.

B.   Shop Drawings:

    1.   Include plans, elevations, sections, and mounting details.
    2.   Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
    3.   Detail fabrication and assembly of TV and wall mount.

1.4   CLOSEOUT SUBMITTALS

A.   Operation and Maintenance Data: For TV and wall mount to include operation and maintenance manuals.

1.5   QUALITY ASSURANCE

A.   Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.6   DELIVERY, STORAGE, AND HANDLING

A.   Deliver, unload and store on site in the area near installation after building is secure, building temperature has been maintained between 50 deg. F and 80 deg. F for a minimum of 72 hours, construction is substantially complete, and finishes have been installed.

1.7   WARRANTY

A.   Original Equipment Manufacturer (OEM) hardware warranty is to be included for a period of (3) years.

B.   Original Equipment Manufacturer (OEM) software support is to be included for a period of (3) years. This includes all security patches and updates.

C.   The integrator will provide a three (3) year initial warranty including the following support:
    a.   90-day full on-site installation warranty
    b.   Remote helpdesk support with 24/7/365 coverage including online help portal
    c.   Annual preventative maintenance inspection visit (total of 3)
    d.   Remote technical support with 24/7/365 coverage from day of final acceptance.

D.   Provide options for years 4 & 5 for integrator's service and maintenance contract as an alternate.

1.8   SCOPE OF WORK

A.   As set in this specification and in Audio visual drawings.

B.   CAT 6A wiring from A/V cabinet as indicated on drawings shall be furnished and installed by General Contractor

C.   Pathways for CAT 6A cabling shall be furnished and installed by General Contractor

D.   All Video wall monitors, mounts and A/V rack/cabinet, controllers, encoders, decoders speakers shall be furnished and installed by A/V Integrator

E.   Speaker wiring (14AWG), J-Hooks for speaker wiring , hdmi wiring , and all composite wiring from controllers to monitors shall be furnished and installed by A/V Contractor

F.   If power is required to the monitors, it shall be furnished and installed by General Contractor as a bid alternate.

G.   All items identified in the section shall be furnished and installed by A/V Contractor

H.   A complete functional video wall with speakers, controllers and capability to be operated and controlled by all SOC positions shall be provided to the Owner

PART 2 - PRODUCTS

2.1   MANUFACTURERS - PREFFERED INTEGRATORS -SOFTWARE

A.   Approved Manufactures

   1.   Barco -Unisee.
   2.   Crestron
   3.   Extron
   4.   Approved Equal

B.   AV Integrators

   1.   All AV Integrators must respond to questionnaire included in RFP excel document.

      a.   Diversified
      b.   AVI Systems
      c.   CTI
      d.   Approved Equal

C.   Software

   1.   Userful Infinity Platform
   2.   Barco CTRL
   3.   Approved Equal

2.2   SYSTEM COMPONETS

A.   Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B.   Refer to Audio Visual drawings.

C.   Video Wall Array

There will be (1) video wall located within the SOC. The (1) primary video wall will be comprised of a 8-wide by 2-high array creating a 24' x 4' visual canvas. The following are the minimum specifications:

   1.   Dimension: Each tile shall be 55" nominal diagonal, bezel-less design.
   2.   Seams: The maximum mechanical seam between adjacent display tiles shall be .3mm or less.
   3.   Resolution: Native resolution shall be full HD (1920 x 1080) in a 16:9 aspect ratio.
   4.   Minimum Brightness: Nominal Brightness shall not be less than 800 nits and consume a maximum of 190 watts.
   5.   Cooling: The display wall tile shall be fan-less, utilizing heat sink technology to insure quiet operation.

6.   Brightness Uniformity: The display wall tile Color and Brightness Uniformity shall be minimum 98% using the 9 point standard.
7.   Backlight Technology: Must utilize micro-LED backlight technology.
8.   Modular Design: Each tile shall consist of a lightweight, solid metal-backed 55" LCM Screen with rear quick-connect docking assembly that is easily removed to reveal three modular "field replaceable" components embedded in the chassis: power supply module, optional redundant power supply module and data/signal input module . Any modular component (55" screen, power module, data/signal module must be capable of being replaced in less than three minutes (MTTR).
9.   Active Automatic Color & Brightness Balancing: Each tile shall include (2) embedded color and brightness sensors to constantly monitor color and brightness values. These values are transmitted to a display wall color/brightness management server that actively manages & achieves across the wall color & brightness uniformity over the lifetime of the system. Each video wall will have its own automatic and brightness balancing system.

D.   Remote Power Supplies

1.   The display wall shall include the ability to remotely locate redundant supplies in a 19" Rack
2.   Remote power supplies shall utilize a 1 RU chassis. Each chassis shall be equipped with (3) switch mode power supplies (SMPS) to drive (6) panels.
3.   The remote power system shall have VDC cables of (10,20,50,100) Meter length. The cables shall be capable of field termination at the panel. The installer shall insure field terminated cables are the overall same length to insure consistent power of each tile across the array.

E.   Display Wall Management

1.   The array of tiles making up the display wall shall be managed using a purpose built high security appliance node networked to each display to monitor via standard IP networking protocols. This wall management appliance shall be capable of turning the wall on and off, switching inputs, adjusting brightness and color temperature, and providing firmware updates to the display tiles. This appliance shall utilize an HTML (Browser) based GUI.

2.   The wall management software shall provide an API for third party control as necessary. The OEM provided Display Wall Management appliance shall serve as a centralized tool which actively receives brightness and color information from the embedded display tile sensors for automatic and active color and brightness management of the display wall tiles without manual intervention. This will ensure a consistent appearance of the entire video wall over time. Each video wall will receive its own Display Wall Management system.

F.   Display Wall Mounting System

1.   The display wall tiles shall utilize an integrated mounting system provided from the display wall tile original equipment manufacturer (OEM) to insure precise .3mm or less mechanical seams, and to insure compatibility and quality of the complete display wall system.

2.   The display wall mounting system must provide managed chases for cabling and integration of the input electronics and power supplies independent of the LCM tile itself, thus reducing risk of damage to the LCM module during integration.

3.   Each tile shall utilize a docking interface which automatically connects both power and signal without the need for additional cabling. The mounting solution shall require a 4" area around the periphery of the array for serviceability of the tiles. Any trim and/or decorative panels that result in less than this 4" area shall be removable.

4.   The video walls will be all mounted via a metal interface to create a flat plane. Removeable trim shall be provided around all displays. All policies of manufacturer standards must be followed.

G.   Serviceability

1.   The display wall mounting system shall provide easy serviceability of each tile utilizing a gravity assisted sliding mechanism permitting easy removal and replacement of tiles. The panel shall be able to be easily replaced and automatically color calibrated to the rest of the video wall without utilization of an external color sensor.

2.   The mounting system shall automatically align the serviced tile on all 3 axis (X, Y, Z) ensuring a perfect seam without the need for special adjustments and tweaks. The removable tile shall not exceed 34 lbs.

3.   The LCM tile shall be field testable in the original OEM packaging without breaking the security seal of the tile. This will permit easy repack and replacement of the panel without risk to the servicer or end user. Any "DOA" Panels shall be replaced by the OEM.

H.   Distributed Network Based Processor

1.   The video wall processing solution shall be distributed and network-based, comprised of mission critical hardware for encoding and rendering combined with a sophisticated software platform specifically designed for control room applications. The same manufacturer for the displays and processing must be used to ensure connectivity.

I.   Hardware

1.   The integrator shall provide and install output nodes that must be a high powered modular & scalable IP-Appliance purpose built with embedded OS and zero trust networking support. Multiple output nodes are deployed to drive a large display wall as one seamless desktop. The system is designed to render encoded streams coming from sources sitting on a standard Gbit Ethernet/IP network via a non-proprietary switch.

2.   The (2) primary video walls shall each have (6) output nodes, the 4th floor executive conference room video wall shall have (3) output nodes. The output nodes shall be located in a rack in the server room near each room. Signal transport via manufacturer cables (composite cable) from the output node to the displays must be provided.

J.   Encoders

     1.   The integrator shall provide and install all encoders and they must be 4K capable, utilize a low latency pixel perfect (L2P2) codec using h.265 for ultra-low end to end latency and provide keyboard/mouse control to the source.

K.   SOC Positions

     1.   (5) Rack-mounted PC Workstations
     2.   (22) encoders for (11) SOC Operator PC connections to allow for wired inputs from both Campus & Hospital Networks.
     3.   The encoders will be located at each operator position and/or the rack in the server room nearest to the location of any rack-mounted PC sources.

L.   Application Server

     1.   The integrator shall provide and install a Windows 10 application server where the OFE SCADA will reside. The application server shall support OpenGL. Content shall be screen scraped and available as a source to any video wall array.
     2.   The application server shall be located in a rack in the server room.

M.   Software

     1.   The integrator shall provide and install a control room management software solution which is a networked visualization software suite providing flexibility and scalability through the use of industry standard networks. The control room management software solution shall support a server /client architecture.

     2.   The control room management software solution should serve as the platform management tool permitting various users to create sources, compile these sources into compositions, and share these compositions to local displays and remote users. The solution shall be standard web browser based and no software or plugin installation should need to take place on any client PCs.

     3.   The control room management software solution shall be installed and configured on (3) central servers configured in a redundancy deployment.

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N.   Audio System

1.   The integrator will provide and install an audio system consisting of a QSC 110F Digital Signal Processor (DSP), accompanying overhead audio speakers and amplification. System shall include (2) ceiling microphone kits manufactured by Sennheiser. (12) 6.5". System shall allow for the audio selection from available sources and for volume control. System shall be controlled via the touch panel described below.

O.   Control System

1.   The integrator will provide and install a third party control system, including a touch panel and web interface GUI. System will control, at minimum, up to 10 preset video wall layouts for the primary video wall, audio control (source selection and volume) and power ON/OFF of the system. System shall include a 10.1" tabletop touch panel.   The manufacturer of the third party control system devices will be Crestron.

P.   Signal Transport

1.   The integrator will provide and install video signal transport from the Output Nodes to the Displays as indicated on the drawings. Transport shall include an HD-Based transmitter and receiver pair (either STP or fiber) or Active-Optical-Cables (AOC) to extend the native HDMI video signal for each indication. All receivers at the video wall shall be remotely powered from the equipment rack with all power supplies, rack mount kits, etc. being furnished and installed by the integrator.

Q.   Racks and Cabling

1.   The integrator will provide and install the required racks for the proposed AV system factoring in 20% for future expansion. All accessories including, but not limited to, side panels, front and rear locking doors, blank/vent panels, integrated fan top, and power panels shall also be provided.
2.   The integrator will provide and install all necessary video and network cables/converters as well as floor/wall boxes for AV inputs.

2.3   TECHNICAL SYSTEM DESCRIPTION

1.   The video wall management system shall be a fully distributed solution, designed for multi-site and multiple server installations requiring 24/7 operation with support for devices from different vendors. The video wall management system software shall offer centralized management of all devices, servers and users.

2.   The video wall management system software shall allow an unlimited number of users and groups to be defined and an unlimited number of displays to be connected to each system across multiple sites if required.

3.   The video wall management system software shall be built on the common security by design principles. The complete and secure operation of the business and operating

networks can be guaranteed by zero trust based support of secure access through state-of-the-art authentication and multi-level authorization to all objects managed in the system, even across site boundaries. All network traffic between the components of the system is encrypted using industry standard protocols

4. The technology and software components shall currently exist in their entirety and be functional and operational as an implemented solution.

5. The video wall system software shall consist of the following core components:

    a. Control/Management
    b. Video Display Processor
    c. Graphical User Interface
    d. Computer Desktop Transport and Remote Control
    e. Separate management interface for administration and control

6. The video wall system software shall support the following optional components:

    a. IP Streaming Video Decoding Application
    b. Mobile Device Interface Application
    c. Desktop to Desktop Screen Share Application
    d. Shared Content Set Application
    e. System Interface Service

7. The video wall management system software shall be built around a core management service that provides primary administrative control over all system functions and resources. The management service shall handle client login, system configuration, asset database and logging.

8. The video wall management system software shall contain one or more video display processors that generate visual information for all system displays under the control of the management service. The system shall support multiple instances of this service to allow effective scaling in larger systems.

9. The video wall management system software shall contain multiple graphical user interface (GUI) modules that provide simultaneous operation to the users with an intuitive interface to control and manage all content to be displayed on a single or on multiple video display processors in real time. The system shall support multiple instances of this webpage to allow effective scaling in larger systems.

10. The video wall management system software shall include an application that provides computer desktop transport and control over the network. The application shall have the capability to capture and transport computer desktops in completely lossless mode or as an encoded IP stream. The application shall support both hardware-based and virtual machine environments.

11. The video wall management system software shall support SNMP v3 that provides capability to independently monitor and report on the health of all major system components with common network monitoring tools.

12. The video wall management system software shall include real time, fully automated, color management tool for the video displays to insure continuous color and brightness uniformity across all displays in the array.

13. The video wall management system software shall support the option for an IP streaming video decoding that provides the system with the capability to view multiple IP video streams from multiple IP camera/streaming video encoder vendors in all industry-standard formats and resolutions. The system shall support multiple instances of this application to allow effective scaling in larger systems.

14. The video wall management system shall support displaying video and control of desktop PCs on different networks while maintaining network air-gap between desktop PC network and AV network. The video wall software can display and control multiple of these air-gapped PCs on the same video wall.

15. The video wall management system software shall support the option for a mobile device application that provides the system capability to capture and display photos and live video streams from a mobile device (mobile phone or similarly connected tablet/iPad device). The mobile application shall have the capability to remotely view and control the video wall system. The system shall support multiple instances of this application to allow effective scaling in larger systems.

16. The video wall management system software shall support the option for a desktop application that provides the capability to share a local desktop with multiple users.

17. The video wall management system software shall support the option for an application programming interface (API) that provides the capability for third-party control systems and applications to send commands to the system via standard TCP/IP protocol.

18. The video wall management system software shall provide a management webpage from where an administrator can configure/manage all servers, system resources and users.

19. The video wall management system software shall allow the management application to be installed on three (3) servers configured as a cluster ensuring that the secondary server in the cluster automatically takes over in case of primary server failure.

20. The video wall management system software shall support the display of standard video signal formats, applications, and industry-standard IP streaming video sources.

21. The video wall management system software shall support integrated audio systems to allow full user control of all audio sources audio defined in the system.

22. The video wall management system software shall be designed in a manner to allow discrete system software modules to communicate from any location within a local area network.

23. The video wall management system software shall support secure methods for data in transit over the network (ie. encrypted, HTTPS/SSL). Video wall management system shall support uploading of SSL certificates.

2.4   SECURITY ADMINISTRATION

    1.   The vendor shall make sure all products proposed, submitted, and installed are TAA compliant.

2.5   SYSTEM ARCHITECTURE

A.   Network

    1.   The video wall management system shall reside on a standard Ethernet- based local area network (LAN). All system communications shall be TCP/IP standards based. Exceptions are limited to external devices under system control that are best communicated with via RS-232, RS-422, or Infra-Red methods.

    2.   Remote access modules shall be capable of residing outside of the LAN where VPN or other standardized networks tunneling protocols are available and even separate air-gapped networks.

    3.   Video installations will be installed on both campus and hospital networks, see drawings for additional information.

B.   Hardware

    1.   The video wall management system hardware shall be comprised of commercially available servers and workstations. Servers and workstations shall be specified, configured, and provided (where possible) by the system provider.
    2.   Servers and workstations shall be configured for resilient 24/7/365 operation with redundant power supplies and RAID 1 or better storage drive systems.
    3.   Servers or workstations configured as video display processors shall utilize high-performance graphics output cards to render the video image for distribution to display systems.
    4.   The video display processor hardware shall be capable of ingesting industry-standard video signals for display, to include DisplayPort, DVI, HDMI, VGA/RGBHV, Component Video and Composite Video.
    5.   The video display processor hardware shall be capable of driving any commercially available display system(s) that utilize industry-standard video signals inputs, to include DisplayPort, DVI, HDMI, VGA/RGBHV, Component Video and Composite Video.
    6.   The core system hardware and video display processor shall be capable of being configured for automatic failover in the event of primary system failure.

C.   Software

1. The video wall management system software architecture shall be modular in design and scalable in function.
2. The system software modules shall be capable of residing on different host machines and communicating via encrypted TCP/IP transmissions within the LAN.
3. Servers and workstations shall support the use of multi-port network interface cards (NICs).
4. The system software shall be capable of being configured for automatic failover in the event of primary system failure.

D.   Sources
1. The video wall management system shall be capable of simultaneously displaying multiple types of video signals, IP based streaming video formats, remote desktops, video graphics, web pages, graphics files, video files, and applications for simultaneous viewing on any system display.
2. The video wall management system shall allow the definition of an unlimited amount of sources.
3. Source shall be defined within the system and available to any authorized user.
4. Sources can be resized, stretched, cropped and scaled across any of the displays on the video wall.

E.   Displays
1. The video wall management system shall be capable of displaying any available system source on any common commercially available display utilizing common standard video signal types.
2. Displays shall be defined within the system and available to any authorized user.
3. Remote displays shall have the capability to be driven via TCP/IP communications via a local display processor.
4. The video wall management system shall allow the definition of an unlimited amount display wall processors.

2.6   FUNCTIONALITY

A.   Graphical User Interface (GUI)
1. The video wall management system shall provide a software-based GUI capable of managing all available system operational functions. The software shall be HTML Web based.
2. The video wall management system GUI shall provide an intuitive means for dynamically arranging content on any of the system displays. It shall provide a graphical representation of all system displays and indicate all content available and currently displayed in the system.

B.   Content Management Functions:

1. Resource view: A list of all available resources available to the system.
2. Resource search: The capability to search system resources by typing the name of the resource.
3. Video wall representation: the capability to see and manipulate a graphical representation of the video wall and/or displays along with the current content being displayed in real-time.
4. Content compositions: The capability to store and recall image locations on the video wall display independently of actual content. New content added to the video wall is immediately aligned to content template boundaries.
5. Presets: The capability to store and recall content along with their relative positions on the video wall.
6. Crop: The capability to remove unwanted peripheral content from displayed content.
7. Zoom: The capability to magnify areas of a displayed source on the video wall.
8. Size: The capability to re-size content as it appears on the video wall; either preserving or modifying the original aspect ratio of the source.
9. Layering: The capability to place content on top of (or underneath) other content on the video wall.
10. Snap: The capability to force displayed content to align with the boundaries of a display.
11. Multi-views: The capability to create multiple alternate versions of displayed video wall content and toggle rapidly between them.
12. Multi-zone audio control: The capability to select audio source and control volume for all audio-capable sources and all audio zones defined within a system.

C.   Remote Desktop Transport Application

1. The video wall system shall include a lightweight application to be installed on host machines intending to be used as sources for the system.
2. The application shall provide lossless transport of the host system's desktop image via TCP/IP protocol.
3. The application shall provide encoded streaming transport of the host system's desktop image via TCP/IP protocol.
4. The application shall communicate with the core system via an encrypted transport mechanism.
5. The application shall provide the capability to transport desktops from hosts with multi-headed displays.
6. The application shall provide the capability to transport individual heads of desktops with multi-headed displays.
7. The application shall provide the capability to transport individual application windows of a remote host.
8. The application shall provide the capability to reduce the active area of the desktop being transported to a smaller, user-defined area.

9. The application shall provide the capability for remote Keyboard and Mouse (KM) control of the host machine.
10. The application shall provide a means to control the rate at which desktop images are transmitted in order to meet network bandwidth limitations.
11. The application shall have the capability to provide notification to the host machine user when the desktop transport is active and connected to the core system.
12. The application shall allow the host machine operator (if authorized) to set control parameters for communication with the core system; disabling KM or desktop transport when desired.
13. The application can be password protected to only allow authenticated user access to the remote desktop.

PART 3 - EXECUTION

3.1   EXAMINATION

A.   Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B.   Proceed with installation only after unsatisfactory conditions have been corrected.

C.   The integrator shall carefully follow the instructions in the documentation provided by the manufacturer to ensure that all steps have been taken to provide a safe, reliable, easy-to-operate system.

D.   All equipment shall be tested and configured in accordance with instructions provided by the video wall system provider prior to installation

E.   The integrator shall conduct a site acceptance test, verifying system performance in the intended environment and commission the system use.

3.2   STARTUP SERVICE

A.   Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 24 months' full maintenance by manufacturer's authorized service representative. Include annual preventive maintenance, repair or replacement of worn or defective components, and adjusting as required for proper operation. Parts and supplies shall be manufacture's authorized replacement parts and supplies.

3.3   DEMONSTRATION

A.   Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain units.

END OF SECTION 274116.50