ATTACHMENT A

DIVISION 274000 - AUDIOVISUAL SPECIFICATIONS

PART I. GENERAL

A. GENERAL PROVISIONS

1. THE PURPOSE OF THESE DOCUMENTS IS TO PROVIDE SUFFICIENT DETAIL FOR THE BIDDER TO UNDERSTAND THE FUNCTIONAL REQUIREMENTS OF THE SYSTEMS, THE INSTALLATION AND PERFORMANCE STANDARDS THAT MUST BE MET, AND THE REQUIRED SCOPE OF WORK, IN ORDER TO GENERATE AND SUBMIT A COMPLETE AND ACCURATE BID.

2. THE GENERAL CONDITIONS, REQUIREMENTS, AND SPECIAL PROVISIONS, OF ANY LARGER BODY OF SPECIFICATIONS, OF WHICH THIS SPECIFICATION MAY BE A PART, ARE HEREBY MADE A PART OF THIS SPECIFICATION. IN THE EVENT THAT ANY CLAUSES OR PROVISIONS OF THE LARGER BODY OF SPECIFICATION CONFLICT WITH THE LETTER OR INTENT OF THIS SPECIFICATION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONSULTANT FOR CLARIFICATION AND DIRECTION.

B. CONTRACTOR QUALIFICATIONS

1. THE CONTRACTOR SHALL BE AN AUTHORIZED RESELLER AND INSTALLER OF PRODUCTS WITHIN THIS PROJECT.

C. SCOPE OF WORK

1. WITH THE EXCEPTION OF PROJECTOR AND PROJECTION SCREEN LOCATED IN CONFERENCE ROOM “C”, THE CONTRACTOR SHALL UNINSTALL CURRENT AUDIOVISUAL SYSTEMS EQUIPMENT, MOUNTS AND CABLING ASSOCIATED WITH AND LOCATED IN CONFERENCE ROOMS “A”, “B” AND “C”. THE CONTRACTOR SHALL REMOVE EQUIPMENT, MOUNTS AND CABLING IN A WAY THAT MINIMIZES DAMAGE TO EXISTING SURFACES AND FINISHES. THE CONTRACTOR SHALL HAND OVER TO OWNER ALL REMOVED EQUIPMENT, MOUNTS AND CABLING.

2. THE CONTRACTOR SHALL PROVIDE COMPLETE, TURNKEY AUDIOVISUAL SYSTEMS PERFORMING ALL OF THE SERVICES AND FUNCTIONS AS DESCRIBED OR GENERALLY INFERRED HEREIN, TOGETHER WITH ALL OTHER APPARATUS, CABLE, MATERIALS, LABOR, CONFIGURATION/PROGRAMMING, TESTING, TOOLS, TRANSPORTATION, AND ANY OTHER RESOURCES NECESSARY TO PROVIDE A COMPLETE SYSTEM.

3. COORDINATION - COMMUNICATING AND COORDINATING DIRECTLY WITH THE CONSULTANT, OWNER, ARCHITECT AND OTHER TRADES COMPLYING WITH ALL REQUIREMENTS AS DEFINED UNDER THIS SCOPE OF WORK AND ELSEWHERE, TO FULFILL ALL REQUIREMENTS OF THIS SPECIFICATION. THE CONTRACTOR SHALL COORDINATE HIS/HER WORK WITH THAT OF OTHER TRADES. THE CONTRACTOR SHOULD ANTICIPATE ATTENDING WEEKLY PROJECT COORDINATION MEETINGS WITH THE OWNER, ARCHITECT, GENERAL CONTRACTOR, CONSULTANT OR OTHER TRADES AS REQUIRED.

D. SITE CONDITIONS

1. CONFLICTS - THE BIDDER SHALL BE RESPONSIBLE FOR INVESTIGATING ANY POTENTIAL CONFLICTS WITH SITE-RELATED OR UNION-RELATED ISSUES REGARDING USE OF PERSONNEL, SCHEDULING, ACCESS TO THE SITE, STORAGE OF TOOLS AND EQUIPMENT ON-SITE, AND OTHER AREAS OF POTENTIAL CONFLICT. IF THESE ISSUES IMPACT THE BIDDER’S BID RESPONSE, THE IMPACTS ON COST AND SCHEDULE SHOULD BE CLEARLY NOTED IN THE BID RESPONSE.

2. THE CONTRACTOR SHALL VERIFY DIMENSIONS OF EQUIPMENT, EQUIPMENT ARRANGEMENTS, SPACE AVAILABILITY (INCLUDING ANY MILLWORK OR CABINETRY PROVIDED BY OTHERS) AND PROVIDE SYSTEMS THAT WORK WITHIN THE CONSTRAINTS OF THE SPACE AVAILABLE. THE CONTRACTOR SHALL NOTIFY THE CONSULTANT OF ANY SITUATION WHERE SPACE CONSTRAINTS ARE A PROBLEM, PRIOR TO THE SUBMISSION OF SHOP DRAWINGS OR THE ORDERING OR PURCHASE OF EQUIPMENT. THE CONTRACTOR SHALL BEAR THE EXPENSE OF PROVIDING ALTERNATE EQUIPMENT, WHICH WILL WORK WITHIN THE AVAILABLE SPACE, IF SPACE AVAILABILITY PROBLEMS ARE DISCOVERED AFTER SHOP DRAWINGS ARE SUBMITTED AND APPROVED.

3. DRAWINGS INDICATE LOCATIONS OF EQUIPMENT AND COMPONENTS. CHANGES IN THE LOCATION, AND OFFSETS OF SAME TO ACCOMMODATE BUILDING CONDITIONS, AND COORDINATION WITH THE WORK OF OTHER TRADES SHALL BE MADE PRIOR TO INITIAL INSTALLATION, WITHOUT ADDITIONAL COST TO THE OWNER.

4. THE CONTRACTOR SHALL REVIEW AND VERIFY ALL CONDUIT, BOXES, AND OTHER CABLING PATHWAYS AS INDICATED IN THE INFRASTRUCTURE REFERENCE DRAWINGS AND PROVIDED BY OTHERS. THIS REVIEW SHALL INCLUDE THE DRAWINGS AS WELL AS AS-BUILT CONDITIONS ON SITE. THE CONTRACTOR SHALL NOTIFY THE CONSULTANT, GENERAL CONTRACTOR, AND ARCHITECT OF ANY DEFICIENCIES, ISSUES, OR INCORRECT INSTALLATIONS ON SITE THAT MAY IMPACT THE INSTALLATION OF THE AUDIOVISUAL SYSTEMS CABLING OR EQUIPMENT AS SPECIFIED. FAILURE TO PERFORM THIS REVIEW WILL RESULT IN A REVISED CABLING APPROACH TO BE DESIGNED, PROPOSED, AND IMPLEMENTED BY THE CONTRACTOR, WITH ANY ADDITIONAL COSTS BORNE BY THE CONTRACTOR.

5. ALL EQUIPMENT, CABLING, MATERIALS, AND INSTALLATION METHODOLOGY SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL BOARD OF FIRE UNDERWRITERS, THE CURRENT PUBLISHED EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL OTHER APPLICABLE LAWS AND REGULATIONS. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ANY ADDITIONAL PERMITS AND INSPECTIONS REQUIRED BY ALL LEGAL AUTHORITIES AND AGENCIES HAVING JURISDICTION OVER THE CONTRACTOR’S WORK.

E. QUALITY ASSURANCE

1. UNLESS OTHERWISE STATED, ALL EQUIPMENT FOR THIS INSTALLATION WILL BE NEW, LESS THAN ONE YEAR FROM THE DATE OF MANUFACTURE, AND WITHOUT BLEMISH OR DEFECT.

2. ALL ELECTRICAL, ELECTRONIC AND OPTICAL EQUIPMENT PROVIDED BY THE CONTRACTOR SHALL BE A PRODUCT OF COMPANIES REGULARLY ENGAGED IN THE MANUFACTURE OF ELECTRICAL, ELECTRONIC OR OPTICAL EQUIPMENT.

3. ALL EQUIPMENT MUST BE PURCHASED FROM A MANUFACTURER-APPROVED DISTRIBUTOR OR RESELLER. PURCHASE OF EQUIPMENT FROM A NON-APPROVED RESELLER IS PROHIBITED.

4. WHERE APPLICABLE, ALL EQUIPMENT MUST HAVE THE MANUFACTURER'S LATEST FIRMWARE VERSION INSTALLED PRIOR TO TESTING AND SYSTEMS PERFORMANCE VERIFICATION.

5. THE CONTRACTOR SHALL SUPPLY AND INSTALL ANY INCIDENTAL EQUIPMENT NEEDED IN ORDER TO RESULT IN A COMPLETE AND OPERABLE SYSTEM WITHOUT CLAIM FOR ADDITIONAL PAYMENT, EVEN IF SUCH EQUIPMENT IS NOT LISTED IN THIS SPECIFICATION.

6. ALL WORK RELATED TO THIS SPECIFICATION SHALL BE COMPLETED IN A PROFESSIONAL MANNER BY FULLY QUALIFIED WORKERS.

F. SUBMITTALS

1. FOLLOWING CONTRACT AWARD, THE CONTRACTOR SHALL PREPARE AND SUBMIT PROJECT SUBMITTAL DOCUMENTATION TO THE CONSULTANT. PROJECT SUBMITTAL DOCUMENTATION TO INCLUDE:

    a. THE CONTRACTOR SHALL PROVIDE A SCHEDULE OF MAJOR PROJECT MILESTONES TO THE OWNER, ARCHITECT, OR CONSULTANT.
    b. CONTRACTOR SHALL SUBMIT A BRIEF PROGRESS REPORT VIA E-MAIL TO THE OWNER OR AN AUTHORIZED REPRESENTATIVE OF THE OWNER. THE PROGRESS REPORTS SHOULD BE CONCISE, UTILIZING BULLET POINTS OR OTHER EFFICIENT FORMAT. THE PROGRESS REPORTS SHALL BE SUBMITTED ON A WEEKLY BASIS.
    c. THE CONTRACTOR MUST RECEIVE WRITTEN APPROVAL FROM THE OWNER OR AN AUTHORIZED REPRESENTATIVE OF THE OWNER, IN WRITING, PRIOR TO PURCHASING, FABRICATING OR INSTALLING ANY EQUIPMENT OR MATERIALS. APPROVAL TO PROCEED WILL BE GIVEN BASED UPON SHOP DRAWINGS. SHOP DRAWINGS SHALL INCLUDE:
        1) SYSTEM SIGNAL FLOW
        2) CABLING SCHEDULE AND LABELING SCHEME
        3) CEILING LOUDSPEAKER LAYOUTS AND COVERAGE PATTERNS
        4) MOUNTING DETAILS
        5) EQUIPMENT RACK ELEVATIONS
        6) CUSTOM INTERCONNECT PANELS
        7) FURNITURE IF PROVIDED BY THE AV CONTRACTOR
        8) STRUCTURAL ANCHORAGE CALCULATIONS, DRAWINGS AND DETAILS – IF REQUIRED. TO BE REVIEWED BY THE AUTHORITY HAVING JURISDICTION.
        9) OTHERS, AS MAY BE REQUIRED BY THE ARCHITECT, CONSULTANT OR OWNER.

    d. THE CONTRACTOR SHALL SUBMIT A COMPREHENSIVE BILL OF MATERIALS CONCURRENTLY WITH THE SHOP DRAWING SUBMITTAL.
    e. THE CONTRACTOR SHALL PREPARE A PACKAGE OF PRODUCT CUT SHEETS FOR REVIEW WITH THE OWNER AT THE TIME OF THE SHOP DRAWINGS.

G. FINAL AS BUILT DOCUMENTATION

1. FOLLOWING SUBSTANTIAL COMPLETION, THE CONTRACTOR SHALL PREPARE AND SUBMIT A FINAL DOCUMENTATION SET TO THE CONSULTANT. FINAL AS BUILT DOCUMENTATION TO INCLUDE:

    a. AS BUILT DRAWINGS
    b. SCHEDULE OF IP AND MAC ADDRESSES FOR ALL ETHERNET ENABLED AV DEVICES, ORGANIZED BY ROOM NAME AND NUMBER, IF APPLICABLE.
    c. LISTING OF EACH SUPPLIED ITEM WITH MANUFACTURER, MODEL NUMBER AND SERIAL NUMBER, ORGANIZED BY ROOM NAME AND NUMBER.
    d. OPERATOR'S MANUALS FOR EACH PIECE OF EQUIPMENT SUPPLIED BY THE CONTRACTOR.
    e. QUICK REFERENCE GUIDES
    f. COPIES OF ALL SOURCE CODE USED FOR THE DEVELOPMENT OF THE PROJECT SOFTWARE, IF APPLICABLE
    g. WARRANTY STATEMENT: A STATEMENT ON THE CONTRACTOR'S LETTERHEAD LISTING THE OFFICIAL START AND END DATES FOR THE CONTRACTOR'S WARRANTY ON ALL EQUIPMENT, MATERIALS, AND LABOR USED IN THE PROJECT. THE START DATE SHALL CORRESPOND WITH THE ESTABLISHED SUBSTANTIAL COMPLETION DATE, AND THE END DATE SHALL BE BASED ON THE TIMEFRAME OF WARRANTY COVERAGE PURCHASED BY THE OWNER AS PART OF THE CONTRACT.

H. WARRANTY

1. THE CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT, MATERIALS, AND LABOR FOR A PERIOD OF 1 YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION.

2. DURING THE WARRANTY PERIOD, WITHIN 24 HOURS OF NOTIFICATION, THE CONTRACTOR SHALL ANSWER ALL SERVICE CALLS AND REQUESTS FOR INFORMATION.

3. DURING THE WARRANTY PERIOD, WITHIN 96 HOURS OF ORIGINAL NOTIFICATION, THE CONTRACTOR SHALL PROVIDE EMERGENCY SERVICE TO RESTORE OPERATION OF THE SYSTEM, REPLACING DEFECTIVE MATERIALS, REPAIRING FAULTY WORKMANSHIP, MAKING TEMPORARY REPAIRS, AND PROVIDING LOANER EQUIPMENT AS NECESSARY, ALL AT NO CHARGE.

PART II. PRODUCTS

A. GENERAL

1. REFER TO DRAWING SHEETS FOR SIGNAL FLOW DIAGRAMS.

2. WHERE THERE ARE MULTIPLE INSTANCES OF THE SAME PRODUCT TYPE IN THE PROJECT THE CONTRACTOR SHALL UTILIZE THE SAME MANUFACTURER AND LINE, WHERE APPLICABLE, FOR THE PRODUCT CATEGORIES LISTED BELOW.

3. ACCEPTABLE MANUFACTURERS/PRODUCTS:
    a. DISPLAYS – ALL PROFESSIONAL GRADE, 16/7 OR 24/7 OPERATION – PLANAR, NEC
    b. MOUNTS – CHIEF, PEERLESS, PREMIER
    c. SIGNAL TRANSPORT – CRESTRON
    d. AV CONTROL – CRESTRON
    e. MICROPHONES – SHURE
    f. LOUDSPEAKERS – RENKUS-HEINZ

4. REFER TO BIDDING EQUIPMENT LIST FOR LIST OF EQUIPMENT

    a. BIDDING EQUIPMENT LISTS ARE PROVIDED TO THE CONTRACTOR FOR USE IN PREPARING THE BID RESPONSE. THESE LISTS INCLUDE MAJOR SYSTEM COMPONENTS AND PERIPHERALS BUT SHOULD NOT BE CONSIDERED TO BE ALL INCLUSIVE. THE COMPLETE EQUIPMENT PACKAGE BID RESPONSE WILL TAKE INTO ACCOUNT THIS DOCUMENT, ALL DRAWINGS, WRITTEN ADDENDA, ANY OR ALL DRAWING ADDITIONS OR REISSUES, AS WELL AS IMPLIED SYSTEM OPERABILITY.

    b. KEYED BIDDING NOTES
        1) A - OFCI (OWNER FURNISHED CONTRACTOR INSTALLED)
        2) B - OFOI (OWNER FURNISHED OWNER INSTALLED, OR PROVIDED BY OTHERS)
        3) C - INCLUDED WITH ABOVE PACKAGE
        4) D - COORDINATE STOCK COLOR/FINISH WITH ARCHITECT
        5) E - CUSTOM PAINTED. COORDINATE WITH ARCHITECT
        6) F - FIELD VERIFY PRIOR TO SUBMITTALS
        7) G - SPECIAL OR NOTEWORTHY INSTALLATION REQUIREMENTS – REFER TO SYSTEM DESCRIPTION FOR DETAILS
        8) H - REFERENCE MANUFACTURER'S MASTER QUOTE

5. CONTRACTOR SHALL PROVIDE ALL AUDIOVISUAL CABLING WITHIN THIS PROJECT. APPROVED CABLE MANUFACTURERS ARE BELDEN, WEST PENN WIRE, EXTRON, CRESTRON, LOGITECH, AND LEGRAND AV. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING EQUIVALENT CABLING THAT IS APPROPRIATE FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.

    A. ALL CABLES RUNNING BELOW SLAB ON GRADE OR IN AN OUTDOOR SETTING SHALL BE OUTDOOR RATED.

    B. ALL CABLES BEING INSTALLED WITHIN A PLENUM ENVIRONMENT MUST BE PLENUM RATED.

6. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY INSTALLATION MATERIALS INCLUDING, BUT NOT LIMITED TO: INSTALLED CABLE, LOOSE CABLE, TERMINATIONS, SIGNAL EXTENDERS, CABLE MANAGEMENT, VOICE/DATA/VIDEO PATCH CORDS, ADAPTERS, I/O PANELS, DEVICE MOUNTS (FLAT PANELS, PROJECTORS, SPEAKERS, CAMERAS, ETC.), CABLE DRESSING, LACING BARS, COPPER BUS BARS, LABELS, RACK SHELVES, RACK MOUNTS, POWER SUPPLIES AND ADAPTERS, POWER STRIPS/DISTRIBUTION AND OTHER MATERIALS AS NEEDED TO INSTALL THE SYSTEMS DEFINED HEREIN.

7. ITEMS SHOWN AS "OFCI" (OWNER FURNISHED CONTRACTOR INSTALLED) WILL BE FURNISHED BY THE OWNER FOR INSTALLATION BY THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR COORDINATING DIRECTLY WITH OWNER.

B. SYSTEMS DESCRIPTIONS

REFER TO SIGNAL FLOW DIAGRAMS FOR REQUIREMENTS. ADDITIONAL REQUIREMENTS FOR EACH SPECIFIC SPACE TYPE AS FOLLOWS.

1. CONFERENCE ROOM “A”:
    a. DISPLAY
        1) THE SYSTEM SHALL HAVE A WALL MOUNTED DISPLAY.
    b. AUDIO
        1) THE SYSTEM SHALL HAVE OVERHEAD LOUDSPEAKERS LOCATED IN LIGHTING BEAM TO SUPPORT VOICE AND PROGRAM AUDIO.
        2) THE SYSTEM SHALL PROVIDE DIVIDE/COMBINE FUNCTIONALITY.
        3) THE SYSTEM SHALL PROVIDE APPROPRIATE LEVEL AND DELAY WHILE IN COMBINED MODE WITH CONFERENCE ROOM “C” AND CONFERENCE ROOM “B”.
        4) REFER TO SIGNAL FLOW DIAGRAMS FOR INPUT LOCATIONS.
        5) REFER TO SIGNAL FLOW DIAGRAMS FOR ASSISTIVE LISTING SYSTEM REQUIREMENTS.
    b. SOURCE DEVICES
        1) REFER TO SIGNAL FLOW DIAGRAMS FOR REQUIREMENTS.
    a. CONTROL
        1) GRAPHICAL USER INTERFACE PROVIDED AT THE WALL LOCATION AND SHALL PROVIDE CONTROL FUNCTIONALITY OF THE SYSTEM. THE SYSTEM SHALL PROVIDE CONTROL OF:
            a. INDIVIDUAL GAIN AND MUTING OF AUDIO INPUTS
            b. OVERALL GAIN AND MUTING OF AUDIO OUTPUTS
            c. SOURCE SELECTION AND POWER FOR THE DISPLAYS
            d. DIVIDE/COMBINE FUNCTIONALITY
    c. MISCELLANEOUS
        1) EQUIPMENT SHALL BE LOCATED AT THE HALLWAY EQUIPMENT RACK, WALL AND BEHIND THE DISPLAY.
        2) PROVIDE NECESSARY POWER DISTRIBUTION, INSTALLATION MATERIALS AS NEEDED.

2. CONFERENCE ROOM “B”:
    a. DISPLAY
        1) THE SYSTEM SHALL HAVE A WALL MOUNTED DISPLAY.
    c. AUDIO
        1) THE SYSTEM SHALL HAVE OVERHEAD LOUDSPEAKERS LOCATED IN LIGHTING BEAM TO SUPPORT VOICE AND PROGRAM AUDIO.
        2) THE SYSTEM SHALL PROVIDE DIVIDE/COMBINE FUNCTIONALITY.
        3) THE SYSTEM SHALL PROVIDE APPROPRIATE LEVEL AND DELAY WHILE IN COMBINED MODE WITH CONFERENCE ROOM “C”.
        4) REFER TO SIGNAL FLOW DIAGRAMS FOR INPUT LOCATIONS.
        5) REFER TO SIGNAL FLOW DIAGRAMS FOR ASSISTIVE LISTING SYSTEM REQUIREMENTS.
    b. SOURCE DEVICES
        1) REFER TO SIGNAL FLOW DIAGRAMS FOR REQUIREMENTS.
    b. CONTROL
        1) GRAPHICAL USER INTERFACE PROVIDED AT THE WALL LOCATION AND SHALL PROVIDE CONTROL FUNCTIONALITY OF THE SYSTEM. THE SYSTEM SHALL PROVIDE CONTROL OF:
            a. INDIVIDUAL GAIN AND MUTING OF AUDIO INPUTS
            b. OVERALL GAIN AND MUTING OF AUDIO OUTPUTS
            c. SOURCE SELECTION AND POWER FOR THE DISPLAYS
            d. DIVIDE/COMBINE FUNCTIONALITY
    c. MISCELLANEOUS
        1) EQUIPMENT SHALL BE LOCATED AT THE HALLWAY EQUIPMENT RACK, WALL AND BEHIND THE DISPLAY.
        2) PROVIDE NECESSARY POWER DISTRIBUTION, INSTALLATION MATERIALS AS NEEDED.

3. CONFERENCE ROOM “C”:
    a. DISPLAY
        1) THE SYSTEM SHALL HAVE A WALL MOUNTED DISPLAY.
        2) THE SYSTEM SHALL HAVE AN OFOI PROJECTOR AND SCREEN
    d. AUDIO
        1) THE SYSTEM SHALL HAVE OVERHEAD LOUDSPEAKERS LOCATED IN LIGHTING BEAM TO SUPPORT VOICE AND PROGRAM AUDIO.
        2) THE SYSTEM SHALL HAVE WALL MOUNTED LEFT AND RIGHT LOUDSPEAKERS.
        3) THE SYSTEM SHALL PROVIDE DIVIDE/COMBINE FUNCTIONALITY.
        4) THE SYSTEM SHALL PROVIDE APPROPRIATE LEVEL AND DELAY WHILE IN COMBINED MODE WITH CONFERENCE ROOM “B” AND CONFERENCE ROOMS “B” AND “C”.
        5) REFER TO SIGNAL FLOW DIAGRAMS FOR INPUT LOCATIONS.
        6) REFER TO SIGNAL FLOW DIAGRAMS FOR ASSISTIVE LISTING SYSTEM REQUIREMENTS.
    b. SOURCE DEVICES
        1) REFER TO SIGNAL FLOW DIAGRAMS FOR REQUIREMENTS.
    c. CONTROL
        1) GRAPHICAL USER INTERFACE PROVIDED AT THE WALL LOCATION AND SHALL PROVIDE CONTROL FUNCTIONALITY OF THE SYSTEM. THE SYSTEM SHALL PROVIDE CONTROL OF:
            a. INDIVIDUAL GAIN AND MUTING OF AUDIO INPUTS
            b. OVERALL GAIN AND MUTING OF AUDIO OUTPUTS
            c. SOURCE SELECTION AND POWER FOR THE DISPLAYS

d. DIVIDE/COMBINE FUNCTIONALITY

c. MISCELLANEOUS
   1) EQUIPMENT SHALL BE LOCATED AT THE HALLWAY EQUIPMENT RACK, WALL AND BEHIND THE DISPLAY.
   2) PROVIDE NECESSARY POWER DISTRIBUTION, INSTALLATION MATERIALS AS NEEDED.

4. HALLWAY:
   a. DISPLAY
      1) THE SYSTEM SHALL HAVE A WALL MOUNTED DISPLAY.
      2) REFER TO SIGNAL FLOW DIAGRAMS FOR QUANTITY AND LOCATIONS.
   b. SOURCE DEVICES
      1) THE SYSTEM SHALL HAVE A DIGITAL SIGNAGE PLAYER LOCATED AT EACH DISPLAY.
   d. CONTROL
      1) THE SYSTEM SHALL CONTROL THE POWER FOR THE DISPLAYS WITH THE DIGITAL SIGNAGE PLAYER.
   c. MISCELLANEOUS
      1) THE DIGITAL SIGNAGE PLAYER SHALL BE CONNECTED TO THE WAKE COUNTY NETWORK.
      2) PROVIDE NECESSARY POWER DISTRIBUTION, INSTALLATION MATERIALS AS NEEDED.

PART III. EXECUTION

A. GENERAL

1. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THIS SPECIFICATION, APPROVED SHOP DRAWINGS, AND MANUFACTURER'S RECOMMENDATIONS.

2. ALL EQUIPMENT, WITH THE EXCEPTION OF PORTABLE EQUIPMENT, SHALL BE FIRMLY FASTENED OR ATTACHED IN PLACE. A SAFETY FACTOR OF AT LEAST FIVE SHALL BE UTILIZED FOR ALL BRACKETS, FASTENERS AND ATTACHMENTS. PROVIDE SAFETY RETENTION CABLES FOR OVERHEAD EQUIPMENT SUCH AS LOUDSPEAKERS, PROJECTORS, ETC.

3. THE CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT IS INSTALLED SUCH THAT PROPER COOLING AND VENTILATION IS PROVIDED.

4. ALL EQUIPMENT SHALL BE INSTALLED IN A MANNER, WHICH PREVENTS HUM, RF/EMI/EMF INTERFERENCE, AND MECHANICAL VIBRATION BASED NOISES (E.G. FAN MOUNTS, ETC.)

5. ALL EQUIPMENT SHALL BE PROTECTED FROM CONSTRUCTION DUST AND DEBRIS UNTIL THE DATE OF SUBSTANTIAL COMPLETION.

6. THE CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT MOUNTING STYLES AND LOCATIONS COMPLY WITH THE CURRENT ADA STANDARDS FOR ACCESSIBLE DESIGN. IF ANY DEVICE OR LOCATION SPECIFIED HEREIN IS FOUND TO BE IN CONFLICT, A CONFIRMING RFI SHOULD BE ISSUED PRIOR TO RELOCATING.

B. CABLING

1. ALL CABLING INSTALLED BY THE CONTRACTOR TO SUPPORT AV SYSTEMS CONNECTIVITY SHALL MEET THE EQUIPMENT MANUFACTURER'S SPECIFICATIONS FOR CABLE AND CONNECTOR TYPES, INSTALLATION METHODS AND ROUTING, SEPARATION DISTANCE FROM ADJACENT SERVICES, MAXIMUM NUMBER OF DISCONNECT POINTS AND MAXIMUM OVERALL CABLE RUN LENGTHS REQUIRED TO MEET THE DESIGN INTENT AND MANUFACTURER'S PERFORMANCE CRITERIA. THE CABLING SYSTEM SHALL BE TESTED AND VERIFIED.

2. NON-CONTIGUOUS CABLE SUPPORT MECHANISMS SUCH AS HANGERS, RINGS, AND HOOKS SHALL NOT BE SPACED FARTHER THAN FOUR (4) FEET APART. ALL MANUFACTURED RACEWAYS USED FOR CABLES SHALL BE INSTALLED ACCORDING TO THE RACEWAY MANUFACTURER'S SPECIFICATIONS

3. THE CONTRACTOR SHALL MAINTAIN, OR WHERE NOT ALREADY EXISTING, PROVIDE THROUGH PENETRATION FIRE STOP SYSTEMS TO PREVENT THE SPREAD OF FIRE THROUGH OPENINGS MADE IN FIRE-RATED WALLS OR FLOORS TO ACCOMMODATE PENETRATING ITEMS SUCH AS CONDUIT, CABLES OR OTHER PATHWAY. FIRE STOP SHALL RESTORE FLOOR AND WALL TO THE ORIGINAL FIRE RATED INTEGRITY. THE FIRE STOP SYSTEMS AND PRODUCTS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH THE PROCEDURES OF U.L. AND MATERIAL SHALL BE U.L. CLASSIFIED AS MATERIALS FOR USE IN THROUGH-PENETRATION FIRE STOPS.

C. LABELS / WIRE MARKERS

1. ALL RACK-MOUNTED EQUIPMENT, SWITCHES, CONTROLS, AND INTERFACE PANELS SHALL BE CLEARLY LABELED.

2. ALL CABLES SHALL BE PERMANENTLY IDENTIFIED AT EACH END BY MACHINE PRINTED CABLE MARKERS.

D. VIDEO DISPLAYS

1. TURN OFF OR DISABLE ALL ECO, GREEN OR ENERGY SAVING MODES ON ALL FLAT PANEL AND PROJECTOR DISPLAYS WHERE DISPLAYS ARE TO BE CONTROLLED BY AN EXTERNAL CONTROL SYSTEM

2. VIDEO SETTINGS SHOULD BE ADJUSTED ON ALL FLAT PANEL DISPLAYS TO OPTIMIZE COLOR AND CONTRAST. SETTINGS SHOULD BE IDENTICAL BETWEEN MULTIPLE DISPLAYS WITHIN THE SAME ROOM, AREA, OR ROOM TYPE. ANY DYNAMIC CONTRAST MODES WITHIN FLAT PANEL DISPLAYS SHALL BE DISABLED.

3. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL WORK IN CLOSE COORDINATION WITH THE OWNER TO DETERMINE THE OPTIMAL LOCATIONS FOR ALL VIDEO DISPLAYS TO ENSURE THAT THE VIDEO DISPLAY POSITIONS MEET THE REQUIREMENTS OF THE OWNER FOR THE APPROPRIATE VIEWING AREA.

E. FURNITURE

1. THE CONTRACTOR SHALL ENSURE THAT EQUIPMENT OR MOUNTING HARDWARE IS COMPATIBLE WITH AND SUITABLE FOR INSTALLATION IN FURNITURE SPECIFIED BY THE ARCHITECT, CONSULTANT, OWNER OR FURNITURE SUPPLIER.

2. THE CONTRACTOR SHALL ENSURE THAT DIMENSIONS AND STRUCTURAL SUPPORTS ARE ADEQUATE FOR THE INSTALLATION OF SPECIFIED EQUIPMENT.

3. THE CONTRACTOR SHALL CONFIRM THAT THE FURNITURE ACCOMMODATES THE AUDIOVISUAL EQUIPMENTS' ENVIRONMENTAL AND ELECTRICAL OPERATING PARAMETERS.

4. THE CONTRACTOR SHALL PROVIDE ANY MODIFICATIONS NECESSARY TO THE MOUNT THE EQUIPMENT IN THE TABLE SURFACE.

F. DEVICE CONFIGURATION AND PROGRAMMING

1. THE CONTRACTOR SHALL PROVIDE PROGRAMMING AND/OR CONFIGURATION AS REQUIRED TO ENSURE FULLY FUNCTIONING SYSTEM(S).

2. DEVICE PROGRAMMING AND/OR CONFIGURATION SHALL FOLLOW OWNER'S STANDARDS WHERE AVAILABLE.

G. TESTING

1. THE CONTRACTOR SHALL INSTALL, CONFIGURE, ADJUST, PROGRAM, AND CALIBRATE ALL COMPONENTS IN ORDER TO OPTIMIZE THE PERFORMANCE OF ALL INDIVIDUAL SUBSYSTEMS AND THE SYSTEM AS A WHOLE. THE CONTRACTOR SHALL VERIFY EACH ITEM OF EQUIPMENT IS FUNCTIONING TO MEET THE DESIGN INTENT AND MANUFACTURER'S PERFORMANCE CRITERIA.

2. UPON COMPLETION OF INSTALLATION, THE CONTRACTOR SHALL TEST EACH FUNCTION OF EACH CONTROL STATION, PUSH-BUTTON PANEL, TOUCH SCREEN PANEL, COMPUTER CONTROL INTERFACE, AND ALL COMPONENTS CONNECTED TO OR INTERFACED TO THE CONTROL SYSTEM TO VERIFY PROPER OPERATION AND THAT EACH SWITCH AND INDICATOR OPERATES AS INTENDED.

H. SYSTEM PERFORMANCE VERIFICATION

1. THE CONTRACTOR SHALL DEMONSTRATE THE PERFORMANCE AND OPERATION OF THE SYSTEM TO THE OWNER'S REPRESENTATIVE FOLLOWING FINAL TESTING.

2. THE CONTRACTOR'S REPRESENTATIVE SHALL BE THOROUGHLY FAMILIAR WITH THE DETAILS OF THE SYSTEM AND FUNCTIONALITY.

3. FOLLOWING THE DEMONSTRATION OF THE SYSTEMS' PERFORMANCE, THE OWNER'S REPRESENTATIVE WILL ISSUE A PUNCH LIST REPORT TO THE CONTRACTOR, IDENTIFYING OMISSIONS, ADJUSTMENTS, AND CORRECTIONS TO THE WORK NECESSARY TO MEET THE REQUIREMENTS OF THE SPECIFICATION.

4. THE PROJECT SHALL BE DEEMED SUBSTANTIALLY COMPLETE WHEN THE OWNER CAN UTILIZE THE SYSTEMS FOR THEIR INTENDED USE.

I. TRAINING

1. THE CONTRACTOR SHALL PROVIDE A TOTAL OF TWO (2) HOURS OF ON-SITE TRAINING IF REQUESTED FOR THE OWNER'S STAFF AT A TIME THAT IS MUTUALLY AGREEABLE FOR THE OWNER AND CONTRACTOR. TOPICS TO BE ADDRESSED IN THE TRAINING INCLUDE THE GENERAL CONFIGURATION OF THE SYSTEM, BASIC FUNCTIONALITY, CORRECT OPERATION PROCEDURES, ROUTINE MAINTENANCE AND UPKEEP.