



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>A Conducting Pre-Installation Activities</b>			
1 Review Audiovisual Project Documentation			
	Drawing types AV signals AV terminology Time constraints Workflow	Ability interpret drawings Ability to convert scales Ability to estimate project and task durations Ability to interpret measurements Ability to interpret symbols and abbreviations	Architectural and engineering drawings Bill of materials Project schedule RACi chart Schematics Statement of work
2 Conduct Technical Site Survey			
	General construction principles  Site access and access limitations  Special requirements (e.g., local code requirements, regulations, special cable requirements, cable management)	Ability to communicate site observations to project management Ability to document observations (e.g., photographs, sketches, layouts, report)  Ability to identify design deficiencies  Ability to identify infrastructure (e.g., conduit, floor boxes, power location, data points, grounding) Ability to identify mounting/rigging points for substructures Ability to identify pathway infrastructure Ability to identify site obstacles (e.g., ceilings, flooring, walls) Ability to identify the need for special equipment (e.g., scaffolding, man lifts, tall ladders, powder actuated tools) Ability to measure distances Ability to verify conduit capacities Ability to verify throw distances Ability to verify throw distances	Architectural and engineering drawings  Bill of materials  Codes (e.g., building, electrical, safety, fire, accessibility)  Hand tools  Ladders  Man lift  RACi chart  Safety standards  Schematics Scope of work



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>A Conducting Pre-Installation Activities</b>			
3 Plan for Audiovisual Installation			
	Activities performed by other construction trades Cable specifications, limits and applications Client network policies Custom fabrication Network provisioning Network terminology Site access and access limitations Site safety requirements Site security requirements Structural load capacities	Ability to acquire special equipment (e.g., scaffolding, man lifts, tall ladders, powder actuated tools, fire extinguishers) Ability to allocate resources Ability to create cable pull lists and hardware lists Ability to identify necessary connectors and cable requirements (quantity and type) Ability to schedule project and task sequences and durations Ability to select correct tools	Architectural and engineering drawings Bill of materials Codes (e.g., building, electrical, safety, fire, accessibility) Delivery schedules Kick-off meeting minutes Network topology Project budget Project schedule Scope of work
4 Evaluate Overall Facility Readiness			
	Activities performed by other construction trades Appropriate site conditions (e.g., dust free, HVAC operational, power, lighting) Building access and obstacles General construction principles Safety and security requirements	Ability to coordinate with project team Ability to interface with other trades Ability to verify project milestones Written communication skills	Construction timelines PPE Stakeholder registry
5 Conduct On-Site Preparations for Installation			
	Ceiling systems Construction terminology General construction principles	Ability to identify hazards Ability to interface with other trades Ability to mark installation locations based on engineering specifications	Architectural and engineering drawings Bill of materials Delivery schedule PPE Scaffolding Schematics Scope of work



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>B Conducting Site Rough-In/First-Fix</b>			
<b>1 Deinstallation of Existing Equipment and Cabling</b>			
	Electrical power Equipment and cabling storage	Ability to cut drywall/plaster board Ability to dispose of equipment and cabling Ability to identify equipment and cabling that should be removed Ability to identify potential hazards Ability to prepare equipment for reinstallation (e.g., testing, cleaning, labeling) Ability to remove equipment and cabling	Architectural and engineering drawings Bill of materials Codes (e.g., building, electrical, safety, fire, accessibility) Hand tools and power tools Ladders Man lifts PPE Scaffolding Schematics Scope of work
<b>2 Mount Substructure</b>			
	Blocking/nogging Construction methods and materials (e.g., concrete, steel, wood, dry wall) Locations for mountings Rigging Seismic restraints	Ability calculate weight capacities Ability to cut drywall/plaster board Ability to install anchors and fasteners Ability to install slotted channel and accessories (e.g., unistruts, threaded rods, pipes) Ability to measure distances Ability to mount to prefabricated structures Ability to select correct mounting hardware for application Ability to test mountings of substructures Ability to verify adequacy of substructures	Architectural and engineering drawings Bill of materials Codes (e.g., building, electrical, safety, fire, accessibility) Hand tools and power tools Ladders Man lifts Powder actuated tools PPE Scaffolding Schematics Scope of work



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>B Conducting Site Rough-In/First-Fix</b>			
3 Pull Cable			
	Cable groupings Cable terminology Cable types and applications Fiber optic cable Service loops Tensile strengths	Ability to apply fire stop materials Ability to apply the conduit fill ratio Ability to cut in mud rings, low voltage rings, electrical boxes/pattresses, backboxes, etc. Ability to determine amount of cable needed per pull Ability to identify and use cable routes/paths for non-conduit cables Ability to identify cable paths by signal types Ability to identify hazards Ability to implement various cable pulling techniques Ability to install cable supports Ability to make a snout (wire pull cable harness) Ability to prepare cables for pulling (e.g., labeling, grouping, aligning) Ability to secure and protect cable ends	Architectural and engineering drawings Bill of materials Cable fasteners Cable pull lists Codes (e.g., building, electrical, safety, fire, accessibility) Hand tools and power tools Ladders Man lifts Powder actuated tools PPE Scaffolding Schematics Scope of work
<b>C Installing Audiovisual Systems</b>			
1 Assemble Audiovisual Rack			
	Electrical power and grounding/earthing Rack accessories and components Screw gun and torque settings Ventilation requirements Weight distribution	Ability to assemble a rack frame Ability to install rack accessories (e.g., lacing, power, fans, peripherals) Ability to label panels Ability to measuring rack units Ability to verify and document equipment information (e.g., serial numbers, MAC addresses, asset tags)	Bill of materials Codes (e.g., building, electrical, safety, fire, accessibility) Hand tools and power tools Rack elevation drawings Rack manual Schematics



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>C Installing Audiovisual Systems</b>			
Wire the Audiovisual 2 Equipment Rack			
	Balanced and unbalanced audio Cable termination types Cable types Connector types Labeling systems Signal types Spacing of components for access to connections	Ability to determine proper cable length Ability to document changes (e.g., mark ups, red lines) Ability to identify proper cables for applications Ability to label cables Ability to terminate cables Ability to test cables Ability to use cable management techniques (e.g., signal separation, bend radius, proper support) Ability to use cable termination techniques (e.g., crimping, soldering, insulation displacement, captive screw, fiber splicing)	Bill of materials Cable termination tools Cable testers Codes (e.g., building, electrical, safety, fire, accessibility) Foil tape Hand tools and power tools Insulation (e.g., heat shrink, sleeves, tubing) Schematics Scope of work
Distribute Audiovisual 3 Equipment			
	Proper loading techniques to avoid equipment damage Site restrictions	Ability to obtaining delivery confirmations Ability to recognize and address damaged equipment upon arrival Ability to use safe lifting techniques Ability to verify and document equipment information (e.g., serial numbers, MAC addresses, asset tags)	Architectural and engineering drawings Bill of materials Client policies and procedures Delivery schedules Equipment manifests Equipment moving devices (e.g., carts, pallet jacks, furniture dollies) Project schedule Schematics Scope of work



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>C Installing Audiovisual Systems</b>			
4 Mount Audiovisual Equipment			
	Acceptable substructures for specific purposes Blocking/nogging Cleaning supplies and techniques Construction methods and materials (e.g., concrete, steel, wood, dry wall) Load capacities Rigging Seismic restraints Tensile and shear strengths Work site safety	Ability to identify correct mountings for components Ability to install mounting brackets and mounting hardware Ability to measure distances Ability to modify substructure as needed Ability to mount on or around customized substructures (e.g., millwork, furniture, enclosures) Ability to prepare cables for termination Ability to secure safety restraints on components Ability to use cable management techniques (e.g., signal separation, bend radius, proper support)	Architectural and engineering drawings Bill of materials Client policies and procedures Codes (e.g., building, electrical, safety, fire, accessibility) Equipment moving devices (e.g., carts, pallet jacks, furniture dollies, equipment hoists) Hand tools and power tools Ladders Man lifts Positioning tools (e.g., levels, lasers, plum bob) Powder actuated tools PPE Project schedule Scaffolding Schematics Scope of work Tap and die set



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>C Installing Audiovisual Systems</b>			
5 Terminate Cables			
	Cable termination types Cable types Connector types Signal types	Ability to apply strain relief Ability to determine proper cable length Ability to differentiate between balanced and unbalanced audio Ability to differentiate between mono and stereo audio Ability to differentiate between single mode and multimode fiber optic cables Ability to identify fiber optic connectors (e.g., sc, st, fc, mt-rj) Ability to identify proper cables for applications Ability to label cables Ability to prepare cables for termination Ability to terminate category cables (i.e., TIA/EIA 568A, TIA/EIA 568B) Ability to test cable terminations (e.g., signal continuity, attenuation, bandwidth, pin out) Ability to test cables Ability to use cable management techniques (e.g., signal separation, bend radius, proper support) Ability to use cable termination techniques (e.g., crimping, soldering, insulation displacement, captive screw, fiber splicing, compression) Ability to use proper safety procedures when working with fiber optics	Bill of materials Cable termination tools Cable testers Codes (e.g., building, electrical, safety, fire, accessibility) Foil tape Hand tools and power tools Insulation (e.g., heat shrink, sleeves, tubing) PPE (e.g., eye protection) RoHS compliance requirements Schematics Scope of work
6 Configure Network Properties of Equipment			
	Classifications of IP addresses (e.g., class A, class B, class C) IPv4 and IPv6 addressing Network connectivity (e.g., static, DNS, DHCP) Network equipment (e.g., switches, routers, gateways) Network terminology Network topologies (e.g., ring, star, bus)	Ability identify AV transport protocols Ability to connect devices to a network (i.e., wireless, wired) Ability to load network configurations into equipment Ability to verify and test network connectivity Communicating with subcontractors	Computer Interface cable (e.g., network, USB) Project network documentation



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>C Installing Audiovisual Systems</b>			
7 Load Configuration and Control Programs			
	Baud rates Signal types	Ability to differentiate between and load device programs (e.g., DSP, controllers, user interfaces) Ability to download and upload firmware updates Ability to establish communications with devices Ability to test communications to ancillary devices (e.g., IR, RF, wireless, RS-232) Ability to verify code is loaded and saved Ability verify correct versions of configuration and control programs	Computer Interface cable (e.g., network, USB) Project network documentation Software for communicating with devices User manuals
8 Test the Audiovisual System			
	Anti-static techniques Electrical safety Ohm's Law Operational procedures for audiovisual equipment	Ability to calculate and verify impedance Ability to compare tests results with specifications Ability to perform corrective actions to systems Ability to select appropriate test equipment and supplies Ability to test components of a audio system (e.g., gain, signal paths, EQ, SPL) Ability to test components of a control system (e.g., signal paths, user interfaces, relays, I/O, IR, RF) Ability to test components of a video system (e.g., gain, signal paths, HDCP, EDID) Ability to troubleshoot AV equipment Ability to use test methods Ability to verify correct cable connectivity Adjusting basic color balance display	Schematics Scope of work Signal verification equipment (e.g., VTG, impedance bridges, multimeters, signal generators) Stakeholder registry White papers





Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>C Installing Audiovisual Systems</b>			
Calibrate the Audiovisual System 9			
	Calibration standards Distributed audio systems HDCP Signal to noise ratio	Ability to adjust assisted listening devices Ability to adjust color balance for displays Ability to adjust equalization of rooms Ability to adjust gain and channel on RF frequencies Ability to adjust gain structure for audio and video Ability to adjust microphones for optimal performance Ability to adjusting camera configurations Ability to aim loud speakers Ability to align display equipment to system configurations for optimal performance Ability to measure signal levels Ability to set audio and video delays Ability to set limits for equipment (e.g., cameras, screens, lifts) Ability to set up EDID	Computer Schematics Scope of work Signal calibration equipment (e.g., VTG, impedance bridges, multimeters, signal generators, RTA) White papers
<b>D Perform Systems Close Out</b>			
Demonstrate to Client or Client's Representative that System Performs to Specifications 1			
		Ability to generate and resolve punch lists and deficiency lists Ability to obtain substantial completion sign-offs Ability to operate the system to specifications Interpersonal communication skills	Computer Project schedule RACi chart Schematics Scope of work Stakeholder registry
Provide Training on System Operation 2			
		Ability to apply training techniques Ability to assess user skill levels Ability to create training attendance logs Ability to operate the system to specifications Interpersonal communication skills	Client policies and procedures Scope of work System documentation (e.g., manuals, quick start guides)



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>D Perform Systems Close Out</b>			
Obtain Project Completion 3 Sign Off from Client or Client's Representative			
		Ability to compile and provide a list of assets and identifying information (e.g., serial numbers, asset tags, makes, models) Ability to compile and provide equipment manuals and accessories (e.g., remotes, user manuals, keys) Ability to deliver finalized project documentation (e.g., as-builts, applicable source code, warranties, SLA, maintenance schedules) Interpersonal communication skills	Project schedule  Scope of work  Stakeholder registry
<b>E Conducting Ongoing Project Responsibilities</b>			
1 Complete Progress Reports			
		Ability to document and report man hours Ability to document and report project delays, design deficiencies, changes in scope of work and requests for additional resources Ability to estimating time to project completion Ability to identify and report damaged, defective or missing equipment Ability to identify the need for and initiate RFI and change order Ability to read and interpret Gantt charts	Budget  Policies and procedures  Project schedule Scope of work  Stakeholder registry
Coordinate with Other 2 Contractors			
	Responsibilities of various contractors	Ability to communicate with other contractors Ability to participate in stakeholder progress meetings Ability to read and interpret Gantt charts Ability to report discrepancies and coordination issues Interpersonal communication	Policies and procedures Project schedule RACi chart Stakeholder registry



Duties and Tasks	Knowledge	Skills and Abilities	Tools, Equipment, and Resources
<b>E Conducting Ongoing Project Responsibilities</b>			
3 Address Needed Field Modifications			
	Construction methods and materials (e.g., concrete, steel, wood, dry wall)  Equipment capabilities	Ability to create field mark-ups (e.g., design changes, site conditions) Ability to determine and communicate the need for field modifications Ability to implement design modifications to accommodate site issues Ability to make installation decisions in response to assessments of sites Ability to obtain approval for field modifications Ability to verify load capacity	Architectural and engineering drawings  Policy and procedures  Project schedule  RACi chart  Schematics Scope of work
4 Repair Audiovisual Systems			
	Client deadlines	Ability to adjust audio gain Ability to adjust color balance for displays Ability to document problem resolutions Ability to identify current configuration and control programs Ability to implement problem resolutions Ability to make recommendations for problem resolution Ability to reload configuration and control programs Ability to repair or replace components of a audio system (e.g., DSP, EQ, speakers, amplifiers, cables) Ability to repair or replace components of a control system (e.g., user interfaces, controllers, cables) Ability to repair or replace components of a video system (e.g., displays, scalars, switchers, cables) Ability to test components of a audio system (e.g., gain, signal paths, EQ, SPL) Ability to test components of a control system (e.g., signal paths, user interfaces, relays, I/O, IR, RF) Ability to test components of a video system (e.g., gain, signal paths, HDCP, EDID) Ability to troubleshooting system problems Ability to use cable termination techniques (e.g., crimping, soldering, insulation displacement, captive screw, fiber splicing, compression)	As-builts Computer Hand tools and power tools Ladders and man lifts Policy and procedures Schematics Service level agreement (SLA) Service log Signal verification equipment (e.g., VTG, impedance bridges, multimeters, signal generators) Source code Tap and die set Warranties



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<b>E Conducting Ongoing Project Responsibilities</b>			
<b>5 Maintain AV Systems</b>			
		Ability to document maintenance Ability to identify and replace consumables (e.g., lamps, filters) Ability to identify components that require repair Ability to implement cleaning procedures (e.g., filters, displays, lens) Ability to obtain parts and supplies for maintenance Ability to perform system and component functionality tests	Component maintenance requirements Hand tools Maintenance logs and checklists Manufacturer's recommended maintenance schedules Schematics Service Level Agreement (SLA) System documentation (e.g., manuals, quick start guides) System maintenance requirements Warranties
<b>6 Maintain Tools and Equipment</b>			
	Drilling and cutting tools (e.g., bits, wire strippers, wire cutters, saw blades) Electrical power and electrical current Grounding/earthing	Ability to calibrate test equipment (e.g., impedance bridge, RTA, fiber meter) Ability to identify defective tools and equipment Ability to identify electrical safety issues relating to tools and equipment Ability to perform pre-use equipment checks Ability to repair or replace defective tools and equipment Ability to tag unsafe electrical tools and equipment Ability to test tools and equipment Ability to verify the integrity of safety equipment and attire	Hand tools Multimeter