**SECTION 27 08 00.41**

**AV SYSTEMS COMMISSIONING**

**BASED ON DFDM MASTER SPECIFICATION DATED 03/01/23**

This section has been written to cover most (but not all) situations that you will encounter. Depending on the requirements of your specific project, you may have to add material, delete items, or modify what is currently written.

Revision History:

In the on-line “DFD Document Library” Under “Master Specifications/Design Guidelines / Division 27 – Communications” see “Div. 27 Revision History”.

1. GENERAL

**SCOPE**

This section includes commissioning forms for construction verification and functional performance testing. Included are the following topics:

[PART 1 - GENERAL](#_Toc73089121)

[Related Work](#_Toc73089122)

[Reference](#_Toc73089123)

[Submittals](#_Toc73089124)

[PART 2 - PRODUCTS](#_Toc73089125)

[(Not Used)](#_Toc73089126)

[PART 3 - EXECUTION](#_Toc73089127)

[Testing and Acceptance](#_Toc73089128)

[Documentation](#_Toc73089129)

Verification Checklists

CV-27 41 00 Audio/Video Systems

CV-27 41 00.01 Identification for Audio/Video Systems

CV-27 41 00.02 Audio/Video Structured Cabling

CV-27 41 00.03 Audio/Video Equipment Room Fittings

CV-27 41 00.04 Audio/Video Patch Cords and Network Wire

[CV-27 41 00.05 Audio/Video Systems]

Add CVs as applicable to match project scope.

Related Work

Section 01 91 01 or 01 91 02 – Commissioning Process

Section 26 05 04 – Cleaning, Inspection, and Testing of Electrical Equipment

Section 27 41 00 – Audio-Video Systems

Reference

Applicable provisions of Division 1 govern work under this section.

AV-Specific

Avixa 10:2013 Audiovisual Systems Performance Verification Guide

Submittals

Reference the General Conditions — of the Contract for submittal requirements.

Reference Section 01 91 01 or 01 91 02 Commissioning Process for Construction Verification Checklist and Functional Performance Test submittal requirements.

Unless noted otherwise, the equipment identified in PART 2 of the referenced section remains the property of the contractor at the completion of the commissioning process.

Additional submittals (e.g., Test Plan, Test Results, Schematics, etc.) required during and in follow-up to construction are detailed in Part 3.

1. PRODUCTS

(Not Used)

1. EXECUTION

Testing and Acceptance

Add content as applicable to include additional involvement by AE.

General

Perform Technical (performance) and Operational (system function) testing of the installed system.

Coordinate test schedule and test plan with the DFD, Agency and AE.

Provide a minimum of two (2) weeks advance notice to allow for participation by those wishing to do so. Failure to provide this notice shall be grounds for the DFD to reject any and all documentation of test results or demonstration and to require a repeat of those test(s) and/or demonstration.

Provide Test Plan as part of the notice or sooner.

Prior to scheduling formal test and demonstration of the installed system:

* Coordinate cleanup and readiness of Telecom and/or AV Equipment Rooms per specification Section 26 05 04 and of all areas where testing /demonstration is to take place. Coordinate with other contractors and agency to limit activity and noise in those areas during testing/demonstration.
* Perform preliminary Technical and Operational testing. Where results indicate a failure, correct conditions prior to formal test and demonstration.
* Complete the applicable Construction Verification Checklists and submit to the AE for review.

Supply all equipment and personnel necessary to conduct functional and performance testing.

All equipment used in testing shall be maintained and calibrated per manufacturer’s guidelines.

Perform tests related to connected equipment by others only with the permission and presence of the agency and/or responsible contractor.

Test Plan

Provide plan customized per project scope. Include Technical and Operational test requirements for each room type including:

* Audio System Performance (AP)
* Video System Performance (VP)
* Control System Performance (CON)
* Electrical Power Sequencing
* Network (wired and wireless)

All functional tests shall be reported as pass/fail. Identify pass/fail limit for each test.

Identify test equipment (make/model) to be used.

Identify set-up of each test including a sketch of the planned set-up (hand-drawn is OK).

Provide examples of test forms/reports to be used.

Technical Testing

Tests shall include, but not be limited to, the following:

Refer to the referenced Avixa Guide for suggested content and methodology. Include references to the guide where applicable.

Example content might include:

* Wire list in the format indicated in specification Section 27 41 00 that identifies each cable type and unique number at both ends of the cable.
* Simple continuity test of all conductors that shall indicate no shorts between conductors. Provide test date and type of test e.g., HDMI cable version 2.2 passed 4K 4:4:4 signal from signal generator using color bars.
* Also include audio test on cables for line level and speaker level signal using signals from 20 Hz to 20 kHz.
* Network/AV (Category) cabling shall list selected test provided by a cable analyzer.
* All microphone cabling test shall include all path of cables used from microphone to equipment input that may include panel input connectors.
* Digital video or IP video systems deployed in this project; the AV System Installer shall provide a full System Report for each AV System. This report shall come from the device IP user interface.
* Digital audio systems in this project shall provide any synchronized clock signal used, sampling rate, network protocol e.g., (CobraNet, AVB, NexLink, Qsys).
* Display panel analysis from test display analyzer for video resolutions at minimum of 4K.

Audio System

Edit to match project requirements.

Video System

Edit to match project requirements.

Control System

Edit to match project requirements.

Electrical Power

Edit to match project requirements.

Network (wired and wireless)

Edit to match project requirements.

Operational Testing

Demonstrate system operation per specification Section 27 41 00 – AUDIO-VIDEO SYSTEMS, Article TYPICAL ROOM/SYSTEM DESCRIPTIONS. The major equipment and functional requirements identified for each room type are the basis for these tests and for expected operation of each room type.

Documentation

Test and Measurement Report

Provide per test plan, documentation of test results for each system and room.

Provide documentation of test equipment make and model used and calibration date of each.

Construction Verification Checklists

Commissioning forms are to be filled in as work progresses by the individuals responsible for installation and shall be completed for each installation phase.

Provide a description of the work completed since the last entry, the percentage of the total work completed for the system for that area and the step of installation or finalization.

Circle Yes or No for each commissioning form item. If the information requested for an item does not apply to the given stage of installation for the system, list it as “N/A”. Explain all discrepancies, negative responses or N/A responses in the negative responses section.

Once the work is 100% complete and the responses to each item are complete and resolved for a given commissioning forms group, mark as complete, initial and date in the spaces provided.

Provide copies of the commissioning forms to the commissioning agent 2 days prior to construction progress meetings.

FOR PRELIMINARY REVIEW, DO NOT INCLUDE ANY of the following COMMISSIONING FORMS. EDIT PART 1 TO INDICATE INTENT FOR FORMS TO BE INCLUDED IN FINAL REVIEW SET.

Edit the individual construction verification checklists and provide additional checklists as needed to reflect the verification requirements of assemblies, components, equipment, and systems to be commissioned on this project.

**CV-27 41 00 –Audio/Video Systems**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) SYSTEM TEST & DOCUMENTATION**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** | **10)** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Test Plan submitted.
2. Technical Testing Complete.
3. Operational Testing Complete.
4. Test and Measurement Report submitted.
5. As-built Drawings submitted.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-27 41 00.01 – Identification for Audio/Video Systems**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) LABELING**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** | **10)** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. AV Equipment Outlet faceplates labeled as specified.
2. Cabling at AV Equipment Outlet labeled as specified and verification at source destination.
3. AV DTP Modular Patch Panels for Project Design Included as specified.
4. Termination of AV DTP Equipment Jacks per Manufacturer Connection specifications.
5. Termination of AV Equipment IP Network Connections.
6. Fiber Optic Patch Panels for AV signals in a point-to-point fiber optic cabling distribution system for transmit and receive equipment use.
7. AV DTP Copper Cabling at Modular Patch Panels at Main AV Equipment Room(s) labeled in accordance with specification requirements.
8. AV Fiber Optic Cabling at Patch Panels at Main AV Equipment Room(s) labeled in accordance with specification requirements.
9. AV riser fiber optic cabling (if applicable) labeled as specified.
10. AV Backboxes, AV Equipment Racks and Cabinets, and AV Enclosures labeled as specified.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-27 41 00.02 – Audio/Video Structured Cabling**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) HORIZONTAL CABLING IN CONDUIT - INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Exposed cabling has been visually inspected for physical damage and any damaged cabling has been replaced. AV Cabling jacket and insulation are in good condition.
2. Cable color(s) matches specification requirements for given cable type.
3. AV Cable listing (e.g., General Purpose, Riser, Plenum) as specified and appropriate for installation environments.
4. Conduits swabbed to remove foreign material prior to pulling cables.
5. AV Cables pulled though conduit at the same time, with pulling lubricant used as required to ease pulling tensions.
6. AV Cabling is splice free.
7. Bend radii conforms to manufacturer recommendations for each cable type.
8. Appropriate slack provided in length required by specifications for given AV cabling type and termination point.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**B) AV UNENCLOSED HORIZONTAL CABLING - INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Exposed cabling has been visually inspected for physical damage and any damaged cabling has been replaced. AV Cabling jacket and insulation are in good condition.
2. AV Cable color(s) matches specification requirements for given cable type.
3. AV Cable listing (e.g., General Purpose, Riser, Plenum) as specified and appropriate for installation environments.
4. AV Cabling supported via “J-hook” or “bridle-type” supports at spacing defined within specifications. (Bridle-type supports configured with bend-radius control.)
Supports are independent of piping, ductwork, equipment, cable tray or other conduit.
5. Minimum separations provided for AV cabling per specifications to minimize EMI.
6. AV Cabling is splice free.
7. Bend radii conform to manufacturer recommendations for each AV cable type.
8. Appropriate slack provided in length required by specifications for given AV cabling type and termination point.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**C) AV EQUIPMENT OUTLET - INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. AV Equipment Outlet faceplate material and color are as specified.
2. AV Outlets installed at locations and heights specified in contract documents for given outlet type.
AV Outlets mounted at same height for given outlet type throughout facility.
3. AV Outlets are level.
4. AV Outlets are flush to finished surface.
5. AV Connector types and colors are as specified.
6. AV Connector positions and faceplate layout are as specified. Faceplate layout for a given configuration is same throughout installation.
7. Unused AV connector positions fitted with a bank insert color-matched to the faceplate color.
8. AV Connectors fitted with Dust Covers as specified and as applicable.
9. AV Outlets secured using tamper-resistant fasteners (if applicable).

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**D) HORIZONTAL CABLING AT AUDIO/VIDEO EQUIPMENT ROOM - INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Modular Patch Panels and Termination Blocks provided as specified.
2. AV Cable is supported at rear of Patch Panels and at entry to Termination Blocks.
3. Copper Twisted Pair terminated as specified. AV Cable jacket is removed only to the extent required for termination and within manufacturers recommended limits.
AV Cable pairs untwisted only to the extent required for termination and within manufacturers recommended limits.
4. AV Cabling secured using hook-and-loop ties within the room.
5. Horizontal Jumper Management in place on AV Equipment Racks as specified.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**E) AV BACKBONE CABLING - INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** | **8)** | **9)** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Fiber Optic Patch Panels and Termination Blocks provided as specified.
2. Unused Fiber Optic Patch Panel positions fitted with blanks or cover plates as applicable.
3. Cable color(s) matches specification requirements for given cable type.
4. Cable listing (e.g., General Purpose, Riser, Plenum) as specified and appropriate for installation environments.
5. Cabling supported within equipment rooms and in vertical chases as specified. Supports are independent of piping, ductwork, equipment, cable tray or other conduit. Wire-mesh-type support grips or other approved means used where cable must bear stress.
6. Appropriate slack provided in length required by specifications for given cabling type and termination point.
7. Cabling is splice free.
8. Fiber Optic Duplex Coupling orientation (e.g., A-B, B-A) is as specified. Fibers positioned in sequence; positions are same at both ends of cable.
9. Metallic Cable armor and/or Shielding bonded to telecommunications ground.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**F) CABLING AND PATHWAYS (AUDIO/VIDEO) - INSTALLATION CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. AV Cable bend radii conform to manufacturer recommendations for given wire type and gauge.
2. Penetrations through floor and rated walls are sealed as specified using an Assembly rated for the wall or floor penetrated.
3. Penetrations through non-rated walls are sealed as specified for given space type.
4. Audio/Video Cabling pulled in separate conduits from normal power, emergency power, security, and control systems.
5. Conduit junction boxes are painted and tagged in accordance with specification requirements.
6. Pull cord provided in each conduit. Includes occupied and vacant conduit.
7. AV Cross-connects are complete and documented as specified.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**G) AV TESTING CHECKS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** | **7)** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Maximum Horizontal Copper Cable (Audio/Video CAT) length is less than 295’ for all cables installed.
2. Copper Horizontal Twisted-pair Cabling Tested as specified.
3. Copper Backbone Twisted-pair Cabling Tested as specified.
4. Copper Horizontal Coax Cabling Tested as specified.
5. Copper Backbone Coax Cabling Tested as specified.
6. Fiber Optic Backbone Cabling Tested as specified.
7. Test Results are documented as specified and submitted for review.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-27 41 00.03 – Audio/Video Equipment Room Fittings**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) EQUIPMENT ROOM FITTINGS**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** | **5)** | **6)** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Equipment Rack(s) and/or Cabinet(s) installed as specified, including clearances, anchoring to floor and side bracing.
2. Equipment Rack(s) configured with vertical management per specification.
3. Cable Runway installed per specification.
4. Drop-outs in place where cable exits cable runway to equipment rack to control cable bending to within bend-radius specifications.
5. Equipment Rack(s), cable runway and other hardware as specified bonded to Telecommunications Ground (TGB or TGMB) in accordance specification requirements. Rack or cabinet finish (paint) removed at point-of-contact with grounding hardware.
6. Power Strip / Surge Suppressor installed per specification.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-27 41 00.04 – Audio/Video Patch Cords**

**and Network Wire**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) AUDIO/VIDEO PATCH CORDS AND NETWORK WIRE**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. Fiber Optic Patch Cords delivered to Agency.
2. Copper Twisted Pair Patch Cords and Work Area Cord Cords delivered to Agency.
3. Coax Patch Cords and Work Area Cords delivered to Agency.
4. Cross-connect wire and Spool holders delivered to Agency.

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |

**CV-27 41 00.05 – Audio/Video Systems**

**Equipment Identification/Tag: \_\_\_\_\_\_\_**

**Location: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**A) AUDIO/VIDEO PATCH CORDS AND NETWORK WIRE**

| **Date** | **Description of Work Performed** | **%****Complete** | **Initials** | **Questions (See details below)** |
| --- | --- | --- | --- | --- |
| **1)** | **2)** | **3)** | **4)** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
|  |  |  |  | **YES****NO** | **YES****NO** | **YES****NO** | **YES****NO** |  |  |  |  |  |  |
| **❑ CHECKLIST GROUP COMPLETE** | **INITIALS:** |   | **DATE:** |   |

**Question Details**

1. .

**Negative Responses**

| **Group/Item** | **Date****Found** | **Found****By** | **Location** | **Reason for Negative Response** | **Resolved** | **Date****Resolved** | **Resolution** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |
|  |  |  |  |  | **YES / NO** |  |  |