

Statement of Work

Falcon Stadium Locker Room Audio-Visual & Telecommunications Package



UNITED STATES
AIR FORCE ACADEMY

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1. PROJECT DESCRIPTION:

1.1. Overview:

The USAF Academy’s Directorate of Athletics (AD) is soliciting bids for a turn-key solution fitting out an approximately 12,000 SF single-story space with a robust audio-visual (AV) system and interior wiring for a telecommunications system. The 12,000 SF space is USAFA’s Home Team Locker Room located at Falcon Stadium, U.S Air Force Academy, CO 80840. The space, created through renovation of existing space and the addition of new space, is currently under construction with a targeted opening date of 22 August 2018. A robust AV system design, detailed in both plans and specifications, was crafted by an AV engineer as part of the overall building design. The AV system is intended to allow video and audio content to be pushed to any of the 15 flat panel displays of varying sizes and functions to be located in seven different rooms throughout the space. The telecommunications system is intended to provide data and voice connectivity at drops located in 11 different rooms throughout the space.

1.2. Background:

The main construction contract for USAFA’s Home Team Locker Room is being administered by the Air Force Academy Athletic Corporation (AFAAC). Colarelli Construction Inc. (CCI) is the general contractor under contract with the AFAAC executing construction. The AV contractor executing this AV/telecom portion of the overall project effort will be required to coordinate closely with the trades overseen by the general contractor. USAFA’s Directorate of Athletics (AD) is considered the Owner of the requirement, although other USAFA entities may be stakeholders in certain elements of the AV/telecom systems provided under this effort. A listing of the various stakeholders is included in section 1.4 of this statement of work.

The table below lists the various rooms throughout the space with audio-visual or telecommunications requirements in this scope of work. Following this table is Fig. 1, a floor plan excerpted from the drawings showing all rooms and furnishings of the space.

Table 1: General AV/Telecom Presence Map (By Room)

Room/Area [number]	Audio-Visual	Telecommunications
IDF [17B]	Backbone/Head End	Backbone/Head End
Press/Camera [17/17A]	X	X
Video/AV [16]	X	X
Multipurpose Locker Rooms [15] & [05]		X
Coaches Locker [14] & Home Team Locker [13]	X	X
Equipment [11] & Green Room [01]	X	X
Training Room [03]	X	X
X-Ray [10] & Exam Rooms [08]		X
Corridors [various]	X	

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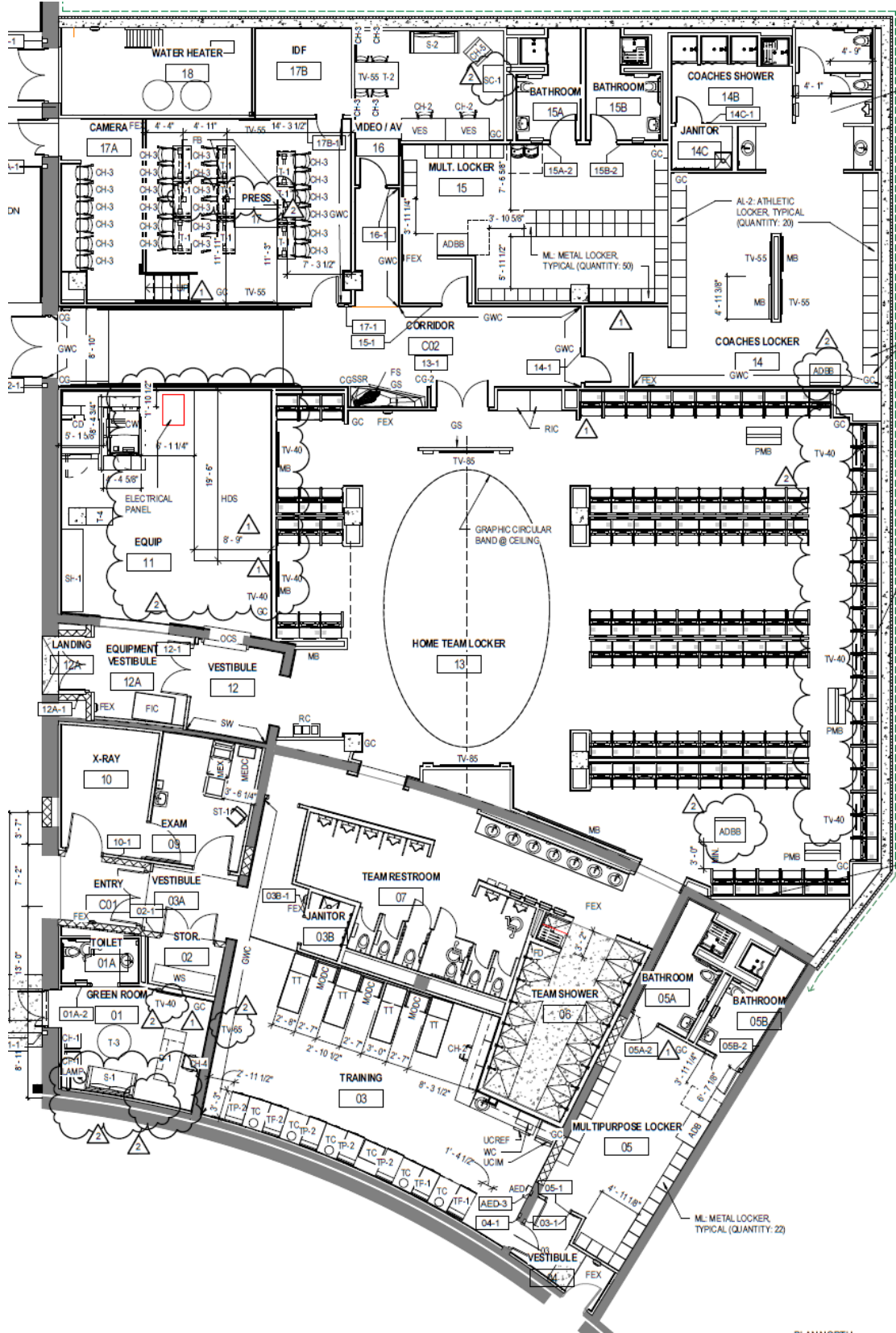


Figure 1: General Floor Plan w/ Furnishings (from AI101)

In the table and figure above, the room listed/labeled IDF [17B], short for Integrated Data Facility, serves as the hub for all AV/telecommunication systems in the space. The IDF [17B] is the entry point for the backbone signals brought into the space. The approximately 10-ft by 10-ft IDF [17B] shall house two racks (one for AV, one for telecommunications), serving as the main signal distribution and processing hubs for all AV and telecommunication systems, including but not limited to, audio and video processing, network switches, routing and distribution equipment, amplifiers, loudspeakers, control processors and interfaces. Additional detail is provided in the remainder of this statement of work and its attachments.

1.3. Project Scope:

The purpose of this section is to articulate the design intent and general system scope of the audio-visual and telecommunications requirements to be provided by the AV contractor. The relevant drawing sheets and specification sections of the full building design are included as a part of this statement of work. Where the term “provide” is used throughout this statement of work, it means furnish, install, program, configure, test, and put into working order. The subsequent sections list assumptions and further describe the project by room or system.

1.3.1. Assumptions:

The following assumptions are provided to assist the AV contractor’s understanding of what is provided by the general contractor or the owner.

AV/Telecommunications Backbone Signals – New backbone cabling and pathways will be provided by the general contractor for AV and telecommunications signal connectivity between existing Falcon Stadium infrastructure and the new locker room space. The backbone cabling infrastructure will consist of the following:

- Fiber (video, commercial internet, USAFA network signals): One 48-strand, Indoor/Outdoor-rated, interlocking armor single-mode fiber optic cable (OS2/OFCP). All strands will terminate in IDF [17B] with LC connectors.
- Copper (cable TV service): One RG-11 coaxial backbone cable. This cable will terminate in IDF [17B]. Comcast is the provider for TV (ESPN, FOX Sports, CBS Sports Network....) in Falcon Stadium. The signal is decrypted and processed by a Q2Q Comcast device within the stadium then distributed to the IDF via RG-11. The Q2Q decrypted signal does not require the use of a Comcast box to process the signal at each end point (flat panel display). It is for this reason that each flat panel display provided by the AV contractor shall require a built-in HD digital tuner to tune and display the signal.
- Copper (telephone service): One 50-pair copper shielded riser cable rated for both indoor/outdoor application. All pairs will terminate in IDF [17B] on a protected building entrance terminal with 66 blocks (Circa model 2650QC/QC or equivalent).

AV/Telecom Rough-In – The general contractor is responsible for in-wall and in-floor rough-in to support cable routing and equipment mounting for all AV/telecom requirements. Rough-in includes in-wall/slab back-boxes and conduits terminating above finished ceiling level. Where wall-mounted flat panel displays are to be located, the general contractor will install in-wall blocking to support the mounts. The general contractor will also provide the above-ceiling conduits shown in drawing TA101 that run between the AV head-end to be located in IDF [17B] and junction boxes within the Camera Room [17A], Home Team Locker Room [13] and Video/AV Room [18]. All physical cable management hardware including, but not limited to: “J-hooks” in accessible ceiling areas, “D-rings” on backboards, vertical and horizontal managers on racks and cabinet shall be provided by the AV contractor in coordination with the various trades of the general contractor.

Owner Furnished Contractor Installed (OFICI) Equipment – The following is a list of owner furnished items that shall be integrated by the AV contractor as part of their turn-key solution to the requirements of this statement of work:

- Telecommunications Rack – One locking cabinet for the telecommunications system shall be provided to the AV contractor for installation, grounding, and integration within the IDF [17B]. The cabinet to be provided is a Cooper B-Line (24”W x 31”D x 88”T).
- Fiber Optic Distribution Panel (FODP) – One FODP shall be provided to the AV contractor to integrate into the telecommunications rack in IDF [17B]. This FODP is intended to serve as the ingest panel of the 48-strand fiber backbone signal, and the point from which the AV contractor shall patch fiber signals for AV requirements.
- Game Clocks – All game clocks shall be provided and installed by others. The model to be used will be the Daktronics TI-2031 Locker Room Clock. As described below, low-voltage signal wiring for these are to be provided by AV contractor,
- Video Editing Stations (VES) – Two Dell Precision 7520 laptop video edition stations located in the Video/AV Room [16] will be provided by the owner. As part of the turn-key solution to this requirement, the AV contractor shall integrate these VESs through connections to the AV headend in IDF [17B] via a wall-mounted junction box.
- Cowboy Remotes - XOS Westwater Remotes shall be provided by the owner to interface with the XOS digital coaching video system. The AV contractor shall integrate these USB remotes using the appropriate connections and routing as called for in the plans and specifications.

1.3.2. Telecommunications System:

Equipment Rack: Install the owner-provided telecommunications equipment cabinet within the IDF [17B] to serve as the telecommunications rack to ingest the backbone fiber and copper phone signals and distribute USAFA's network data and voice signals to drop locations throughout the renovation area. The telecommunications rack shall have a 10" vertical wire manager. Ground and bond the rack and all metallic hardware components to the telecommunications grounding bus (TGB) bar in the IDF [17B].

Copper Wall Tie and Cat5e Patch Panel: On a wall adjacent to the protected building entrance terminal (installed by general contractor) in the IDF [17B], provide and connect a 100pr copper wall tie and a Cat5e Patch Panel on the telecommunications equipment rack. Terminate cable on 110 style blocks on wall. Terminate all 100 pair on a 568B patch-panel utilizing 2 pair per port (pairs 1/2 on port 1 pins 4/5 & 3/6, pair 3/4 on port 2 pins 4/5 & 3/6, etc).

FODP: Install the owner-provided fiber-optic distribution panel (FODP) into the telecommunications rack. Connect the backbone fiber (48 LC-connector terminated fiber optic strands) to the FODP. To convey all signals needed to support the AV system requirements, provide 24 single-mode fiber optic patch cables between the telecommunications rack FODP and the necessary components in the AV rack.

Cat6 Patch Panels & Cable Managers: Provide two 48port Cat6 patch panels. Terminate all Cat6 drop cables to the patch panels. Provide three 2U cable managers and locate them above, between, and below the two Cat6 patch panels.

Drop Locations & Cabling: Highlighted for convenience in Figure 2, there are 18 drop locations for distribution of USAFA data/voice signals throughout the space. Between 17 of the 18 drop locations and the IDF [17B], provide 4ea Cat6 plenum-rated cables (blue in color). The final drop location only requires 2 cables (noted with different indicator on Figure 2 and in plans). At each drop location wall outlet, provide modular stainless-steel faceplates and terminate the Cat6 drop cables on Cat6 RJ-45 modular jacks. As previously noted, at the IDF [17B] end of each Cat6 drop cable, terminate on the two Cat6 patch panels in the telecommunications rack. After installation of all cables, test and label IAW applicable and current TIA/EIA standards and provide a copy of the test results (hard copy or .pdf) to the 10th Communications Squadron.

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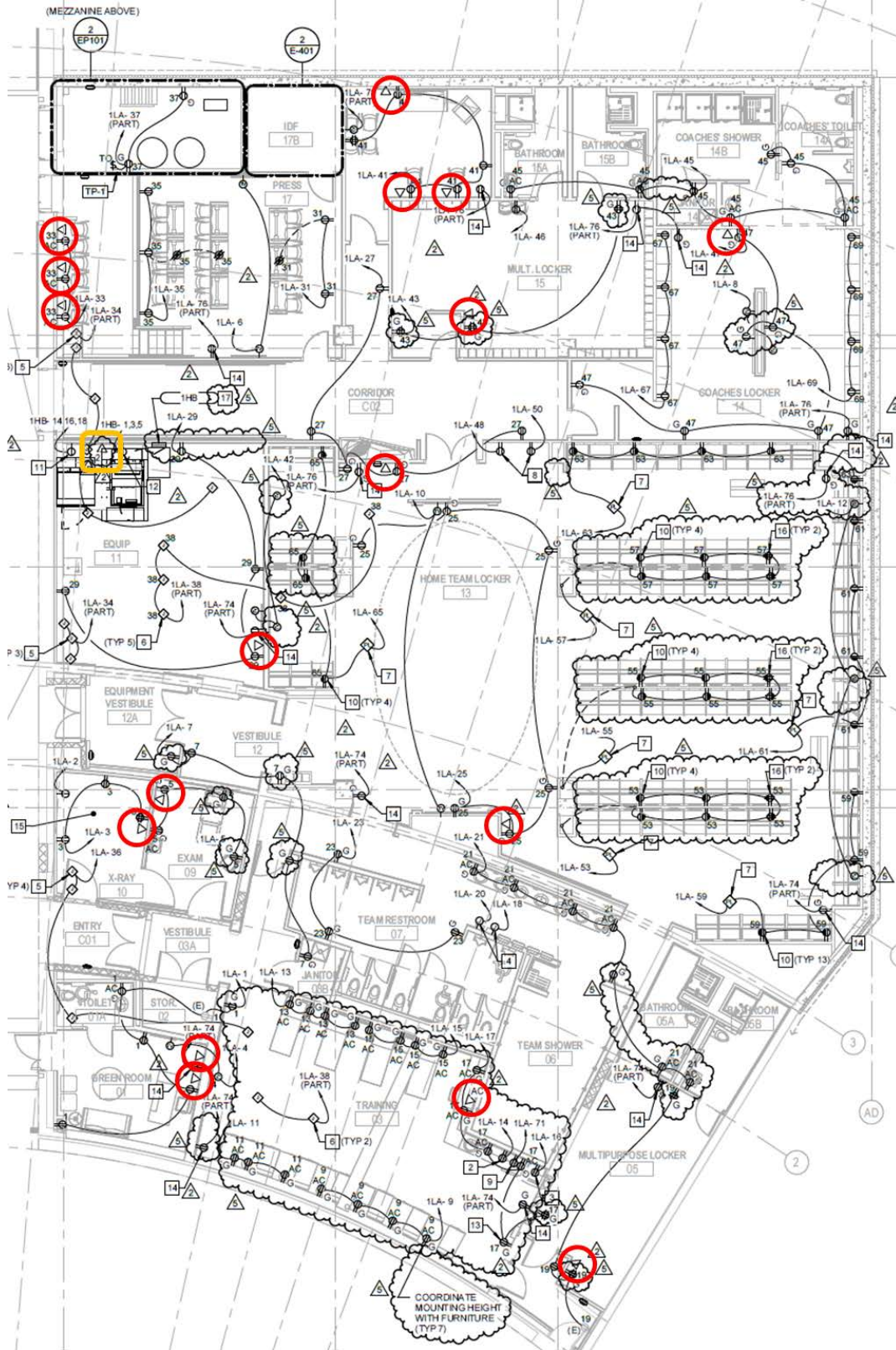


Figure 2: Floor Plan Highlighting Phone/Data Drop Locations (from EP101)

1.3.3. Audio-Visual System:

The specific requirements for the audio-visual system is captured in detail within the drawings and specifications of the building design, most notably the TA sheets in the drawings and specification sections 274100 (Audio Visual Systems) and 274140 (CATV Distribution System). The narrative provided below captures the general intent of the robust AV design. Unless otherwise noted previously or below, it is intended the AV contractor shall provide all necessary items required for a turn-key system as described, which includes but is not limited to, active and passive equipment, AV rack, cabling, speakers, control panels, junction boxes, flat panel displays and their mounts.

IDF [17B]:

A dedicated AV equipment rack will be located within the IDF [17B] and serve host to main signal ingest, processing, and distribution for dedicated AV signals throughout the renovation area as follows:

- Video processing and control equipment including routers, distribution amplifiers, media format convertors, control processors, control panels, self-powered audio loudspeakers for distribution of multimedia content on owner provided PCs (2), existing DVSPORT HD system, or existing 3-Play 4800 system outputs.
- Coaxial CATV headend equipment, including amplifiers, splitters, taps and filters will be provided as required for a complete and functional system. CATV distribution equipment will be mounted on a wall-field within IDF [17B].
- Horizontal RG-6 cabling will be provided between modular type termination plates and wall mounted field as indicated on drawings. Flat panel displays with internal tuner cards to process the CATV signal will be located as noted in drawings.
- Content and signals from Falcon Stadium Press Box connections will be coordinated by Owner, but at minimum include fiber optic transport of video feeds, PA system audio and local dry contact control connection to Fire Alarm Control Panel “FACP” for system muting and override.
- Audio processing and control equipment including, routers, digital signal processors, power amplifiers, I/O panels, control processors and ancillary equipment.

Press/Camera Room [17 & 17A]:

This space is envisioned to serve as a press interview room and be used by the writing press and associated media outlets during events within the facility. While the room can operate autonomously, it is expected to be overridden and controlled by USAFA AV staff during live interviews. The Press/Camera Room system shall contain the following:

- (2) wall-mounted 55” flat panel displays for video payout.
- Mic/Line inputs located on connection plates within floor boxes for connection to owner provided dynamic microphones.
- Overhead loudspeakers for voice lift and/or mix minus applications.
- (1) portable 16 channel analog compact mixing console
- (1) active transformer-isolated press “mult” box with (2) mic/line inputs with individual gain controls and 16 transformer isolated outputs for press recording devices.
- Broadcast cabling junction box and termination plates for patching in audio mixing console and/or headend.

- 10” touch panel for room control including presets, audio and video sources, volume and lighting scenes.

Video/AV Room [16] and Video Coaching System:

This system is envisioned to be used by coaching staff as a tool to provide curated video replay content to displays located throughout the renovation space as needed. Content will be ingested from video editing workstations connected to the AV equipment headend in IDF [17B] via wall mounted I/O termination plates in Video/AV Room [16]. USB signal extension wall plates for video remotes, or “Cowboy Remotes” has been provided to enable coaching to interface to content remotely within spaces as needed. Refer to routing table at the end of this section for additional requirements. Video/AV Room [16] will contain the following:

- Video editing workstations or laptops provided by owner.
- (1) 55” wall mounted flat panel displays for local monitoring.
- USB extenders for Cowboy video remote coaching control interface.
- Broadcast cabling junction box and I/O plates for patching interface to headend.

Home Team Locker Room [13]:

This space is envisioned be an interactive and immersive team experience and coaching system. Displays in the room will be used to display video content from various sources, and augment the traditional coaching experience with video and audio content. The major system components are as follows:

- (2) 85” wall mounted flat panel main displays, backbox and modular I/O plate
- (5) 40” with mounts flat panel auxiliary displays, backbox and modular I/O plate. The three (3) 40” flat panel displays on the east side have an articulating mount as called for in the drawings.
- Full range, high fidelity audio system including ceiling-mounted loudspeakers and subwoofers tied to AV headend.
- Local AV interface plate with Bluetooth, line and mic level audio, HDMI, and USB inputs,
- 10” LCD control panel for system control of sources, volume and equipment state control,
- USB extenders for Cowboy video remote coaching control interface.
- Broadcast cabling junction box and termination plates for patching.

Coaches Locker Room [14]:

- (2) 55” wall-mounted flat panel displays, backbox and modular I/O plate.
- Ceiling-mounted loudspeakers tied to AV headend.
- Local AV interface plate with Bluetooth, line and mic level audio, HDMI, and USB inputs.
- 10” LCD control panel for system control of sources, volume and equipment state control.
- USB extenders for Cowboy video remote coaching control interface.

Training Room [03]:

- (1) 65” Flat panel display, backbox and modular I/O plate, local HDMI input plate
- Control of flat panel volume, source and power through volume controller.
- AV interface plate with Bluetooth, line audio input to headend.
- Ceiling-mounted loudspeakers with dedicated zone volume/source selector tied to AV headend.

Green Room [01]:

- 40” wall mounted flat panel display, backbox and modular I/O plate, local HDMI input plate.
- Control of flat panel volume, source and power through IR remote.

Equipment Room [11]:

- 40” wall-mounted flat panel display with back box and modular I/O plate. Though not called for specifically in the drawings, this flat panel mount shall be articulating due to its location in the corner.
- Control of volume, source, and power in this space shall be done through IR remote.

Corridors [various]:

- Distributed audio coverage with ceiling-mounted 70V overhead speakers. Audio headend equipment in IDF [17B] will serve as the location of signal origin, amplifiers and processing equipment for this system.

Flat Panel Displays & Mounts: The AV contractor shall provide all flat panel displays and wall mounts as summarized above and described in the plans and specifications. All flat panel displays shall be hi-def/4K resolution for premium video quality and equipped with built-in tuners compatible with the CATV signal.

Table 2: Signal Routing Matrix

		Matrix Router	Coaching Video PC 1	Coaching Video PC 2	Green Room	Training Room	Equipment	Home Team Locker Large Display 1	Home Team Locker Large Display 2	Home Team Locker Aux Displays	Coach Locker Room Display 1	Coach Locker Room Display 1	Video/AV	Press Room Display 1	Press Room Display 2
	ROOM NUMBER	17B	16	16	1	3	11	13	13	13	14	14	16	17	17
SIGNAL TYPE	Connector	Inputs			Outputs										
LOCAL DISPLAY INPUTS															
Wall Plate	HDMI		X	X	X	X		X	X		X	X	X		
CATV DISTRIBUTION															
COAX	RG-6 (F-Type)	X			X	X	X	X	X	X	X	X	X	X	X
HD-SDI DISTRIBUTION															
Video Room PC1	HD-SDI (BNC)	X						X	X				X	X	X
Video Room PC2	HD-SDI (BNC)	X						X	X				X	X	X
Press Camera	HD-SDI (BNC)	X						X	X				X	X	X
ROUTER INPUTS															
3-Play	FIBER (LC)	X	X	X											
DVSPORT	FIBER (LC)	X	X	X											
MISC SIGNAL EXTENSION*															
USB Extension	USB- CAT5e		(2)RX	(2)RX				TX	TX		TX	TX			

* USB extension provided for Cowboy Remote. Connect to OFE PCs in Video Room.

1.3.4. Game Clock Wiring:

In addition to the telecommunications and AV systems described above, cabling for transmitting the low-voltage game clock time signal to owner-provided game clock locations throughout the space shall be provided by the AV contractor. Figure 3 is provided to highlight the game clock locations (labeled as GC). The backbone game clock signal enters the space at the game clock (GC) location in the SW corner of the Training Room [03]. The game clocks to be furnished and installed by the owner are: Daktronics TI-2031 Locker Room Clock. The general contractor is providing the back boxes and dedicated power receptacles to support the clocks at each of the 14 locations shown in Figure 3. The AV contractor shall provide the low-voltage wiring between the game clock back boxes in accordance with the game clock manufacturer's recommendations.

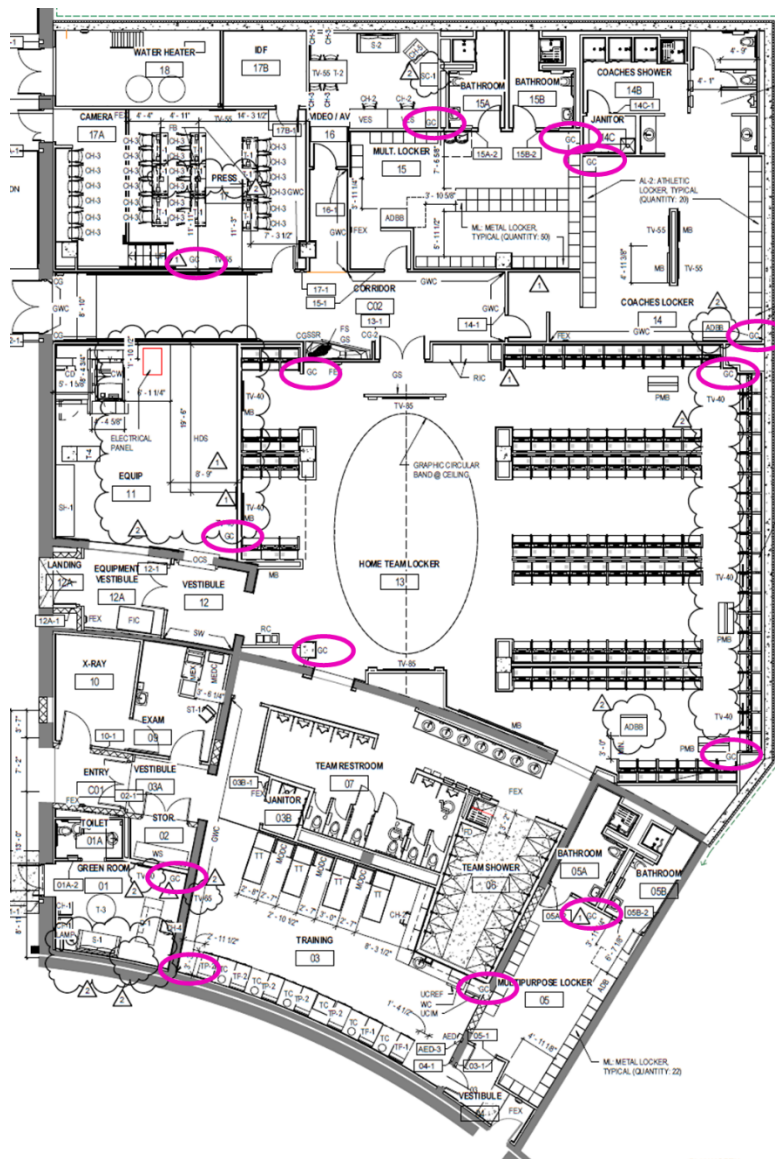


Figure 3: Floor Plan Highlighting Game Clock Locations (from AI101)

1.4. Stakeholders, Influence, and Interest:

The following table summarizes the stakeholders in the project. Under the stakeholder column: AD refers to USAFA’s Directorate of Athletics (a federal entity), AFAAC refers to the Air Force Academy Athletic Corporation (a non-federal entity that works in conjunction with AD); 10 CS refers to the 10th Communications Squadron. “Influence” column lists the reason that accounts for the stakeholder’s influence, and “Interest” column describes what aspects of the project of interest to the stakeholder.

Stakeholder	Influence	Interest
AD – Lead Project Representative ██████████	Overall AD lead for facility projects	All aspects of the AV / telecom requirements.
AD – Falcon Vision ██████████	Operator of press media content	Press Room / Camera Areas
AFAAC – Football Video ██████████	Curator/editor of football video for coaching content	Video/AV Room, Coaches/Home Locker Rooms
AD – Sports Medicine ██████████	Director of sports medicine	Training Room, Exam Room, X-Ray Room AV/telecom requirements, including dedicated Cat6 for replay
10 CS – Telecom ██████████	Owner of the telecom portions of this requirement; system maintainers after acceptance	All telecommunications requirements, including TC rack in IDF and all data/voice drops
AFAAC – Main Construction Project Contracting Agent ██████████	Administering the main building construction contract held by Colarelli Construction, Inc.	All aspects of the AV/telecom requirements
AFAAC – IT Section ██████████	IT operators for the AFAAC; users of the AV/telecom systems in the locker room	Game Clocks, CATV, commercial internet
General Contractor ██████████	General Contractor	All aspects of the AV/telecom requirements as they integrate with the GC’s construction schedule and quality

2. PROJECT SCHEDULE:

The offeror must be able to perform the work in accordance with a schedule as described below. The targeted turnover date of the locker room, including the scope included in this statement of work, is 22 August 2018 to support occupancy and usage during USAFA's opening football game on 1 September 2018. According to the general contractor's schedule, installation of the drop ceiling grid is scheduled to start 2 July 2018, installation of ceiling fixtures to start 13 July 2018, and installation of ceiling tiles to start 27 July 2018. As a result, all above-ceiling cabling and conveyances provided by the AV contractor shall be installed by 29 June 2018. Termination and testing of cables can take place after 29 June, however the required completion date of a fully integrated system is 10 August 2018. End user training for the audio-visual portions of the requirement shall be scheduled to be accomplished NLT 24 August 2018.

Summarizing Project Schedule Requirements:

- Installation of All Cable/Conveyances: NLT 29 June 2018
- Cable Termination/Testing: NLT 10 Aug 2018
- AV System Fully Operational: NLT 10 Aug 2018
- End-User Training on AV System: NLT 24 Aug 2018

3. SUBMITTAL & ACCEPTANCE:

- The submittal requirements included as part of the specifications sections of this requirement are applicable.
- For all installed cables, the contractor shall submit the cable test results (hardcopy or .pdf) to the 10th Communications Squadron (██████████).
- The contractor shall provide a detailed list of all equipment with manufacturer, model number, and serial number for inventory management purposes.
- The contractor shall ensure full functionality of the AV systems at the completion installation.
- For the audio-visual portions of this requirement, the offeror will provide end-user training as described in specification section 274100.

4. LIST OF ATTACHMENTS

Attachment 1 – Drawings: Select drawings from the full building design documents have been provided (46 of the 120 sheets of the full building design). Only those drawings considered most relevant have been attached, however the full set of design drawings can be made available upon request. Of the 46 drawings attached, the following 17 are highlighted for their relevancy to the requirements of this statement of work:

- AI101 – FFE Floor Plan: Drawing illustrates general floor plan with furnishings & equipment, including general locations of flat panel displays.
- AI150A – Reflected Ceiling Plan: Drawing illustrates ceiling plan, including ceiling type and general speaker locations.
- EP101- Electrical Plan: Drawing shows locations of the 18 data/voice drops.
- TA001 to TA611: Technology sheets detailing the robust AV design.

Attachment 2 – Specifications: Select specification sections from the full building design documents have been provided. The two specification sections listed below are included for their relevancy to the requirements of this statement of work, however the full set of specifications will be made available upon request.

- 274100 – Audio-Visual Systems
- 274140 – CATV Distribution Systems