

FACILITIES SERVICES  
1631 LAFRANCE STREET  
ATLANTA, GEORGIA 30307

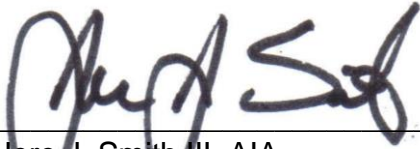
**JERE J. SMITH III, AIA**  
DIRECTOR OF CAPITAL IMPROVEMENTS  
(404) 802-3736  
FAX (404) 802-3897  
[jersmith@atlanta.k12.ga.us](mailto:jersmith@atlanta.k12.ga.us)

**BULLETIN  
TO  
DESIGN AND CONSTRUCTION PROFESSIONALS**

**Date:** April 2, 2018  
**Bulletin:** 0002 – 2018  
**Division:** 11 00 00 – Theater Lighting, Sound and A/V Equipment  
**Re:** APS Design Guidelines and Standard Specifications Update

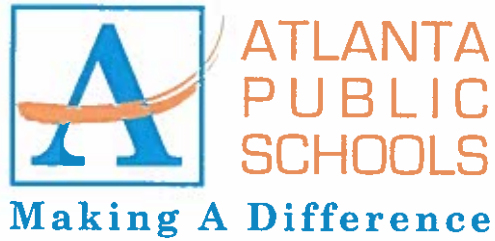
---

- Item 1:** This is a clarification, change or addition to the existing Atlanta Public Schools (APS) Design Guidelines and Standard Specifications dated December 1, 2010 and any previous Bulletins.
- Item 2:** This set of requirements and specifications should be implemented IMMEDIATELY on all projects that are in the “Construction Document” phase of the project delivery process. On projects where the “Construction” has begun, these requirements and specifications should be implemented IMMEDIATELY, WHERE PRACTICAL as to not adversely impact the schedule, budget or overall delivery of the project.
- Item 3:** The existing APS Design Guidelines, Division 11 00 00, Theatrical and Stage Equipment should be amended and supplemented by the attached Standards for Theater Lighting, Sound and A/V Equipment (dated April 2, 2018).



---

Jere J. Smith III, AIA  
Director of Capital Improvements



## **Atlanta Public Schools**

Facilities Services  
1631 LaFrance Street, N.E.  
Atlanta, Georgia 30307  
Telephone: (404) 802-3700

# **Standards for Theater Lighting, Sound and A/V Equipment**

April 2, 2018

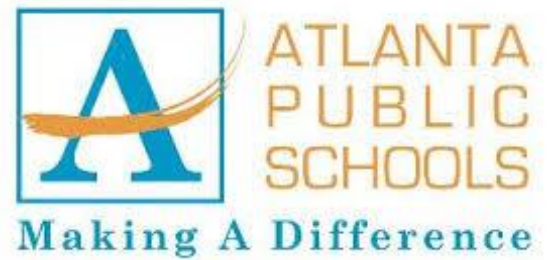
Approved by:

  
Dr. Sara Womack, NBCT  
Fine and Performing Arts Coordinator

4/12/18  
Date

VERSION 1.0

April 2, 2018



# THEATER LIGHTING, SOUND & A/V STANDARDS

PRESENTED BY:



## APS THEATER LIGHTING, SOUND & A/V STANDARDS

---

### **ABSTRACT**

It is important to acknowledge that it would be impossible or impractical to have identical systems at each school. Each of the buildings' physical attributes are different, so what is possible at one location may not be possible or functional at another. For example, some of the existing stages have inadequate height or structural rigidity to support hoisted lighting or scenery battens. The programs offered and the level of expertise in each of the programs vary from school to school. One school's focus may be musical or choir performances, while another school's may be theatrical productions. System controls that one program deems necessary may be overwhelming or cumbersome to another. It is likely that any renovations or alternations intended to make facilities equal would occur over the course of several years. During that time, products or systems used on the first renovations may be superseded by better versions or may become unavailable. Therefore, any baseline or standard established for Atlanta Public Schools will need to be considered within the context of the physical facility, programs, staff at the school, and in consideration of available products at the time.

---

## DETERMINING TYPE OF THEATER (TIER)

The following criteria will help determine the Theater type/tier. Each Theater Tier will have different requirements under Lighting, Sound, A/V, Production Intercom, Rigging & Curtain Sections. Atlanta Public Schools Fine & Performing Arts Coordinator and His/Her Committee will determine the rating points for each facility based on enrollment, quality and types of programming available in the spaces provided at the facility. The Theater Tier will be determined by the total of the rating points as listed below:

Rating Points:

- Band/ Orchestra Program (0-10 pts.)
- Dance Program (0-5 pts.)
- Choir Program (0-5 pts.)
- Drama Program (0-10 pts.)
- Assembly (0-5 pts.)

Theater Tiers

- High School
  - Tier 1: Rating points less than 19.
  - Tier 2: Rating points between 20 and 25.
  - Tier 3: Rating points 26 or above.
- Middle School
  - Tier 1: Rating points less than 19. [Legitimate Stage]
  - Tier 2: Rating points 20 or above. [Legitimate Stage]
  - Portable – Gym
  - Portable/Fixed – Cafetorium
- Elementary School
  - Tier 1: Rating points less than 19. [Legitimate Stage]
  - Portable Equipment – Gym
  - Portable/Fixed – Cafetorium

---

## THEATRICAL LIGHTING

System Requirements for each Tier:

All Tiers:

- DMX transmitted via an IP network over Cat 5/6 cabling. System will support bi-directional RDM and ETC Net3 protocol.
- DMX Outlets located throughout Stage and Catwalk Areas
- House Lighting control scene and touch screen stations (where required)
- Aisle & Stair Tread Lighting, chair mounted lighting preferred. Lighting circuit should be routed through Theatrical Dimming system for control.
- Fixture quantities listed are the minimum, provide quantities as required to adequately cover the stage/performance space.

Tier 1:

- (48) Dimmer Channel Capacity (DRd Rack and Relay Panel)
- 2-Universe 40 Fader Lighting Console w/ a 7" touchscreen display and a 24" external display (ETC ColorSource 40AV console)
- (20) RGBW LED Ellipsoidal Profile Fixtures (ETC S4 LED Series 2 Lustr Array)
- (12) RGB LED Wash Fixtures (ETC D40 Vivid)
- (6) RGB LED Zoomable Wash Fixtures (Elation Fuze Wash Z350)
- (2) LED Intelligent Lighting Fixture – Mover (Elation Platinum Spot III)
- (1) 1500W Follow Spot Light (Canto 1500FF)
- House & Theatrical Lighting control scene and touchscreen stations as required for layout and function at each facility.

Tier 2:

Main Theater:

- (96) Dimmer Channel Capacity (Combination of Sensor3 Rack and Relay Panel)
- Minimum of 4-Universe (2048 Output Channels) Lighting Console w/ (2) 24" external touchscreen displays (ETC Ion Xe-2K console)
- (36) RGBW LED Ellipsoidal Profile Fixtures (ETC S4 LED Series 2 Lustr Array)
- (16) RGB LED Wash Fixtures (ETC D40 Vivid)
- (10) RGB LED Zoomable Wash Fixtures (Elation Fuze Wash Z350)
- (6) LED Intelligent Lighting Fixture – Mover (Elation Platinum Spot III)
- (6) LED Cyc Wash Fixtures (Elation TVL CYC RGBW or ETC S4LED w/ CYC Adapter)
- (6) Net3 DMX/RDM Gateways
- (1) 1500W Follow Spot Light (Canto 1500FF)
- House & Theatrical Lighting control scene and touchscreen stations as required for layout and function at each facility.

Blackbox Theater:

- (48) Dimmer Channel Capacity (Combination of DRd Rack and Relay Panel)
- Minimum of 4-Universe (2048 Output Channels) Lighting Console w/ (1) 24" external displays (ETC Ion Xe-2K console)
- (20) RGBW LED Ellipsoidal Spot Fixtures (ETC ColorSource CSSPOTS)
- (8) RGB LED Wash Fixtures (ETC ColorSource PAR)
- (8) RGB LED Zoomable Wash Fixtures (Elation Fuze Wash Z120)
- (4) LED Intelligent Lighting Fixture – Mover (Elation Platinum Spot II)
- (4) Net3 DMX/RDM Gateways
- House Lighting control scene wall stations as required for layout and function at each facility

---

## THEATRICAL LIGHTING (CONT.)

### Tier 3:

#### Main Theater:

- (144-192) Dimmer Channel Capacity (Combination of Sensor3 Rack and Relay Panel)
  - Minimum of 8-Universe (4,096 Output Channels) Lighting Console w/ (2) 24" external touchscreen displays (ETC Ion Xe-4K console)
  - (60) RGBW LED Ellipsoidal Profile Fixtures (ETC S4 LED Series 2 Lustr Array)
  - (24) RGB LED Wash Fixtures (ETC D40 Vivid)
  - (16) RGB LED Zoomable Wash Fixtures (Elation Fuze Wash Z350)
  - (10) LED Intelligent Lighting Fixture – Mover (Elation Platinum Spot III)
  - (8) LED Cyc Wash Fixtures (Elation TVL CYC RGBW or ETC S4LED w/ CYC Adapter)
  - (6) Net3 DMX/RDM Gateways
  - (2) 1500W Follow Spot Lights (Canto 1500FF)
- House & Theatrical Lighting control scene and touchscreen stations as required for layout and function at each facility.

#### Blackbox Theater:

- (96) Dimmer Channel Capacity (Combination of DRd Rack and Relay Panel)
  - Minimum of 4-Universe (2048 Output Channels) Lighting Console w/ (1) 24" external displays (ETC Ion Xe-2K console)
  - (30) RGBW LED Ellipsoidal Spot Fixtures (ETC ColorSource CSSPOTS)
  - (16) RGB LED Wash Fixtures (ETC ColorSource PAR)
  - (12) RGB LED Zoomable Wash Fixtures (Elation Fuze Wash Z120)
  - (4) LED Intelligent Lighting Fixture – Mover (Elation Platinum Spot II)
  - (4) Net3 DMX/RDM Gateways
- House Lighting control scene wall stations as required for layout and function at each facility.

---

## HOUSE LIGHTING

- Considerations:
  - Illumination levels for Auditorium/Theater area should have an average footcandle between 40-70. (Reference APS Design Guidelines v2.10)
  - Fixture should utilize LED modules with a minimum CRI 80 and color temperature 4100°K unless otherwise noted or scheduled. (Reference APS Design Guidelines v2.10)
- Controls
  - House lighting circuits should be routed through Theatrical Dimming System for control via wall stations and dimming console. Time schedule can be set through the dimming system software to comply with energy code automatic lighting control requirements.
  - Unless otherwise noted, dimming LED drivers shall be controllable from 100% to 1% using one of the following control methods: 0-10V or DMX.

---

## AUDIO

System Requirements for each Tier:

All Tiers:

- CD/Bluetooth/AM-FM/ Media Player (Denon DN-300Z or equal)
- Hearing Assistance System, designed to comply with 2010 ADA guidelines
- Digital Signal Processor for speaker limiting/EQ and control of Wireless/Wired Hot Mics, Overall System volume control from Stage.
- Miscellaneous: (2) Mic Stands, (2) Handheld Hardwire Microphones, (4) 25' Mic Cords

Tier 1:

32-Channel Digital Audio System

- Mixer Console w/ minimum of 24 Fader Strips (A&H QU-24/32)
- Minimum 12-Ch Input/ 8-Ch Output Stagebox connected via Cat 5/6

12-Ch of Wireless Microphones w/ Antenna Distribution System

- (4) Channels of Handheld Units w/ Shure SM58/SM86/SM87 capsules
- (8) Channels of Bodypack Units w/ a combination of Headworn and Lavalier microphones

Tier 2:

48-Channel Digital Audio System

- Mixer Console w/ minimum of 60 Fader Strips (A&H GLD-80 or SQ-5)
- Minimum 24-Ch Input/ 12-Ch Output Stagebox connected via Cat 5/6

18-Ch of Wireless Microphones w/ Antenna Distribution System (Minimum)

- (6) Channels of Handheld Units w/ Shure SM58/SM86/SM87 capsules
- (12) Channels of Bodypack Units w/ a combination of Headworn and Lavalier microphones

Tier 3:

64-Channel Digital Audio System

- Mixer Console w/ minimum of 120 Fader Strips (A&H dLive C3500)
- Minimum 48-Ch Input/ 24-Ch Output Stagebox connected via Cat 5/6

24-Ch of Wireless Microphones w/ Antenna Distribution System (Minimum)

- (6) Channels of Handheld Units w/ Shure SM58/SM86/SM87 capsules
- (18) Channels of Bodypack Units w/ a combination of Headworn and Lavalier microphones

Portable:

- (1) Pair of Powered Loudspeakers w/ (2) subwoofers and associated stands/cables.
- (1) Rolling cart with the following items:
  - 24-Channel rack mounted mixer (Allen & Heath QU-24)
  - 4-Ch Wireless Microphone Systems
  - 12-Ch mic input on back of rack
  - CD/Bluetooth/AM-FM/Media Player (Denon DN-300Z or equal)
  - Rackmount Power Conditioner / power strip
- (4) Handheld Hardwired Microphones (Shure SM58/SM86/SM87) w/ cables (25')
- (2) Choir Boom Stands w/ (2) Choir Microphones
- (2) Telescoping Mic Stands w/ dual head mic holder
- (2) Passive Direct Box (Radial ProD2 or equal)
- (1) Passive A/V Direct Box (Radial ProAV2 or equal)



---

## VIDEO PROJECTION

Design Narrative: The video projection system (VPS) design should consider the type of functions that are likely to require video projection, the size of the space, furthest viewing position and type of projection (front or rear).

Projector:

1. Single Chip, Laser Phosphor, 8500 ANSI lumens or better (DPI E-Vision Laser 8500). Lens selection to match throw distance of the VPS design.
2. I/O ports for control of projector lift and projection screen.

Inputs/Sources:

1. Stage input plates (stage right/left or floor pockets) back to source rack in booth. Transmission via Cat6. Input plate should include HDMI and VGA/3.5mm.
2. Booth video input (HDMI) for a computer.
3. Booth video output (HDMI) for preview monitor.
4. Blu-ray player in source rack.

Screen:

1. Motorized screen with wall mounted low voltage control system and I/O ports for control via 3<sup>rd</sup> party system.
2. Aspect Ratio: 16:10
3. Size: Site conditions will determine screen size, minimum should be 14'-0" diagonal.
4. Type: Front or Rear Projection, site conditions will determine type screen.

---

## PRODUCTION INTERCOM

Design Narrative: The production intercom system design should provide communication path for audio/video technical personal and/or performers backstage and FOH. System design should incorporate a combination of hardwired plug-in and speaker stations.

Portable: Not Applicable – System not required.

Tier 1: Not Applicable – System not required.

Tier 2: (6) Belt Packs, Remote plug-in stations in FOH, A/V Booth and Backstage Areas.  
Speaker Stations in Dressing Rooms and Green Room.

Tier 3: (8) Belt Packs and (10) headsets. Remote plug-in stations at FOH, A/V Booth, and stage manager panel. Speaker stations in Dressing Rooms, Green Room and Backstage Areas.

---

## THEATER RIGGING

Design Narrative: The Theater Rigging system design should consider size and shape of the performing space as well as the type and quality of the performances. The theater space should include at minimum the following items:

Tier 1:

- (2) Front of House Electrics, Accessed via Catwalks
- (2) Stage Electrics (Catwalk accessible, if possible)
- Pipe grid above stage for support of fixtures.
- No Provisions for Scenery or Backdrops

---

## THEATER RIGGING (CONT.)

### Tier 2:

- (2) Front of House Electrics, Accessed via Catwalks
  - (3) Stage Electrics (Catwalk accessible, if possible) [Motorized TBD]
  - (4) Scenery and/or Backdrop Pipes (1 downstage, 1 midstage, 2 upstage)
  - (2) Stage Light Booms/Trees
- Pipe grid above stage for support of fixtures.

### Tier 3:

- (2) Front of House Electrics, Accessed via Catwalks
- (4) Stage Electrics [Motorized]
- (6) Scenery and/or Backdrop Pipes (2 downstage, 2 midstage, 2 upstage) [Motorized TBD]
- (4) Stage Light Booms/Trees

### Fixed Stage (Cafetorium)

- (1) Front House Electric (Static)
- (2) Stage Electrics (Static)

---

## CURTAINS

Design Narrative: The Curtain system should be designed in conjunction with the Theater Rigging system. The curtain design/layout should consider size and shape of the performing space as well as the type and quality of the performances. The theater space should include at minimum the following items:

### Tier 1:

- Front Curtain (Motorized, Bi-Parting)
- Main Valance
- Border & Legs as required
- Rear Curtain (Non-Motorized, Bi-Parting)

### Tier 2:

- Front Curtain (Motorized, Bi-Parting)
- Main Valance
- Borders & Legs as required
- Rear Curtain (Non-Motorized, Bi-Parting)
- Rear Cyclorama (Muslin)
- Small Ensemble – Portable Acoustical Shell (Wenger Legacy Select Model) – APS

### Tier 3:

- Front Curtain (Motorized, Bi-Parting)
- Main Valance
- Border & Legs as required
- Tabs & Tormentors as required
- Midstage Curtain (Non-Motorized, Bi-Parting)
- Midstage Scrim
- Rear Curtain (Non-Motorized, Bi-Parting)
- Rear Cyclorama (Muslin)
- Small Ensemble – Portable Acoustical Shell (Wenger Legacy Select Model) – APS

---

## CURTAINS (CONT.)

### Fixed Stage (Cafetorium)

- Front Curtain (Non-Motorized, Bi-Parting)

- Main Valance

- Border & Legs as required

- Rear Curtain (Non-Motorized, Bi-Parting)

### Fixed Stage (Gymnatorium)

- Front Curtain (Non-Motorized, Bi-Parting)

- Main Valance

- Border & Legs as required

- Midstage Curtain (Non-Motorized, Bi-Parting) [Dependent on depth of stage]

- Rear Curtain (Non-Motorized, Bi-Parting)