



22 North Plains industrial Rd
Suite #4
Wallingford, CT 06492
Telephone: (203) 294-9400
Fax: (203) 294-9404
supertech-inc.com

Lighting System Inspection Report

Staples High School Auditorium
70 North Avenue
Westport, CT 06880



Requested By: Theodore Hunyadi
Inspection Date: October 18, 2022
Inspectors: Steve Hamelin
Jamie Burnett

Staples High School Auditorium
Inspection Report on Stage Lighting and Stage Rigging Systems
10/18/2022

I.) Stage Rigging

The stage rigging is in generally poor condition, with multiple instances of incorrect methods used.

A.) The stage rigging has been inspected and a report has been provided. Rigging notes below pertain to the lighting system.

Recommendation: The stage rigging should be repaired and/or replaced per the rigging inspection. Upgrades to more current equipment such as motorized rigging could be considered, and they would improve the ability for safer methods of operation for staff and students.

B.) The chain hoist control system for existing trusses is installed as a temporary system. The system does not have enough control channels for all six chain hoists, requiring repatching of hoist cables and introducing the possibility of error when controlling the hoists, which could lead to a dangerous situation when moving the trusses. Three of the chain hoists are hung motor up and three are motor down.

Recommendation: Install a permanent installation motor control system, with a minimum of control for six motors, permanent cabling in conduit, and a remote to allow operation from a position where the trusses and motors can be seen while moving. Rehang all hoists with motors up to interface with new control system. Replace span sets on trussed with engineered truss pickups.

C.) The balcony rail is presently being used as a lighting hanging position. Fixtures are hung yoked out, putting stress on the balcony rail, which is not designed for this purpose. Access to the lighting fixtures is limited and sight lines are, in some cases, obscured.

Recommendation: Install a new engineered hanging position, which will allow for the lighting fixtures to be hung without stressing the balcony rail, preferably out of audience sight lines, with permanently installed circuiting and control to minimize loose cables on the balcony.

D.) Proscenium arch has torm pipes that are jury rigged from two smaller torm pipes and additional pipes clamped to them.

Recommendation: Replace torm pipes with new single unit torm pipes with welded angles and flanges and midpoint bracing, that extend from the bottom of the valance to the floor.

E.) Rear of house lighting positions are difficult to access, and are fabricated with non-welded components.

Recommendation: Replace torm pipes with new torm pipes with welded angles and flanges. Consider repositioning for easier access. Provide permanent circuiting and control to eliminate unsightly loose cabling.

II.) Stage Lighting

The stage lighting system is in fair to poor condition, and most of the current equipment is no longer manufactured. The system design relies upon outdated concepts, with local dimmer bars at various locations. A DMX control system is present, but it does not incorporate modern distribution or networking capabilities.

This is a relatively large theater, but the system design requires extensive cabling, instead of having circuits and control points available at locations throughout the theater. There is temporary cabling being used as permanent wiring in many locations and flexibility is limited by the system design.

There are numerous code issues throughout the space. Much of the lighting equipment is either not functioning, or it is in need of repair. Work lighting is inadequate for production work in the space.

The house lighting system is in need of repair and or replacement, with many of the controls inoperable. Adequate house lighting is an important life safety issue.

A.) Front of house (FOH)

The front of house positions are difficult to access. Lighting fixtures are hung on tormentor pipes which utilize threaded connections, which do not meet ANSI standards.





Recommendation: The front of house positions could be remounted lower for easier access. Refabricate new form pipes with welded corners and flanges. Permanent power and control wiring should be installed.

B.) Balcony Rail

Lighting is hanging from the balcony guard railing. Temporary cabling is used instead of permanent wiring for power and control. This could be hazardous to audience members during a performance. Sight lines are impacted by lighting fixtures.



Recommendation: A separate hanging position could be created 6 or 8 Inches out from rail so lights could be hung in proper orientation with the yoke mounted vertically, to keep lighting fixtures away from the audience area and out of audience sight lines. Permanent conduit and circuit boxes should be run out to the new hanging positions.

C.) Balcony Rail Follow Spot Positions

Follow spot positions are installed with inadequate add on hardware. Lighting fixtures are clamped to balcony guard railing. Power cable on homemade dimmer box is pulling out of its strain relief, and the box is missing covers, exposing sharp edges.



Recommendation: Lighting fixtures are clamped to balcony guard railing and should be mounted on follow spot stand pipe. Permanent power and control wiring should be provided. Upgrading fixtures upgraded to LED will no longer require a separate dimmer. City Theatrical offers a follow spot kit for more stable mounting, handling, and balance of the fixture.

D.) FOH Catwalk

The front of house catwalk is covered with a wire mesh fencing for safety. Dimmer bars are attached to hanging rail, but extensive cabling is required to reach the lighting fixtures. Dimmer bars obstruct the lighting fixtures on the pipe.



Some of the outlets are damaged or in need of repair.



Various boxes for rehearsal lights, DMX, and dimmer power are located throughout the catwalk area, but they are disorganized and do not provide a coherent circuiting layout for lighting fixtures.



Recommendation: The catwalk power and control distribution should be reorganized and replaced. New outlet boxes and DMX outlets should be mounted at locations across the catwalk to minimize extra cabling.

E.) Side Tormentor Positions

The side tormentor positions offer flexibility not found in most theaters. Dimmer bars at a single location necessitates having to run cables all over the position.



Recommendation: Dimmer bars should be replaced with permanent power and control wiring at multiple locations to minimize cabling all over the position.

F.) Proscenium Tormentor Positions

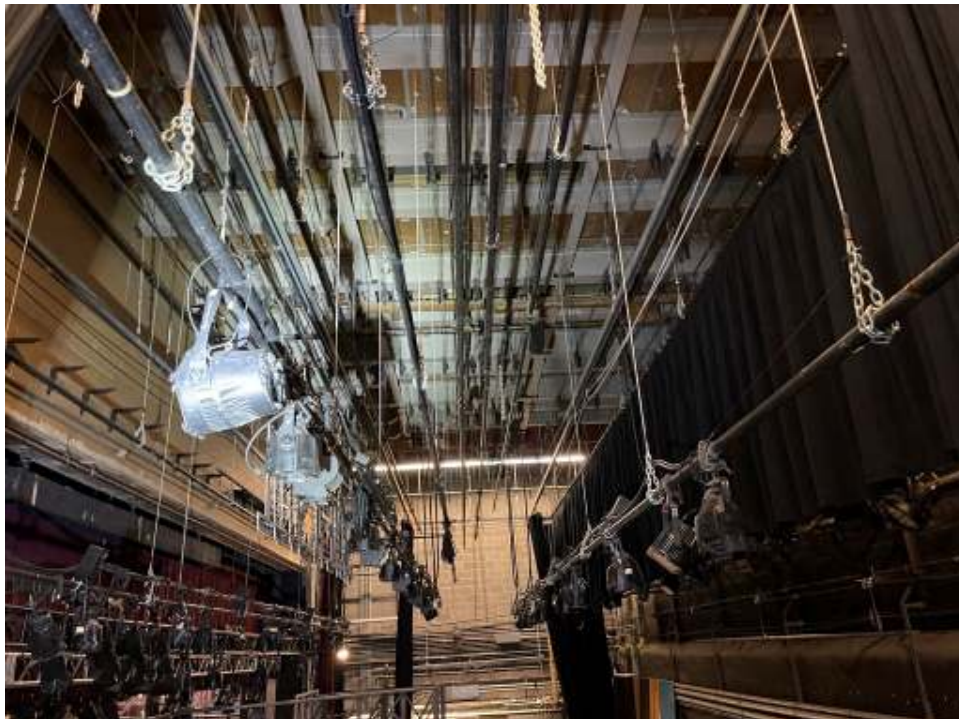
Tormentor pipes mounted to proscenium provide a useful hanging position, but they are fabricated improperly.



Recommendation: These positions should be replaced with properly fabricated single units with welded components and mounted to the floor.

G.) Stage Electrics

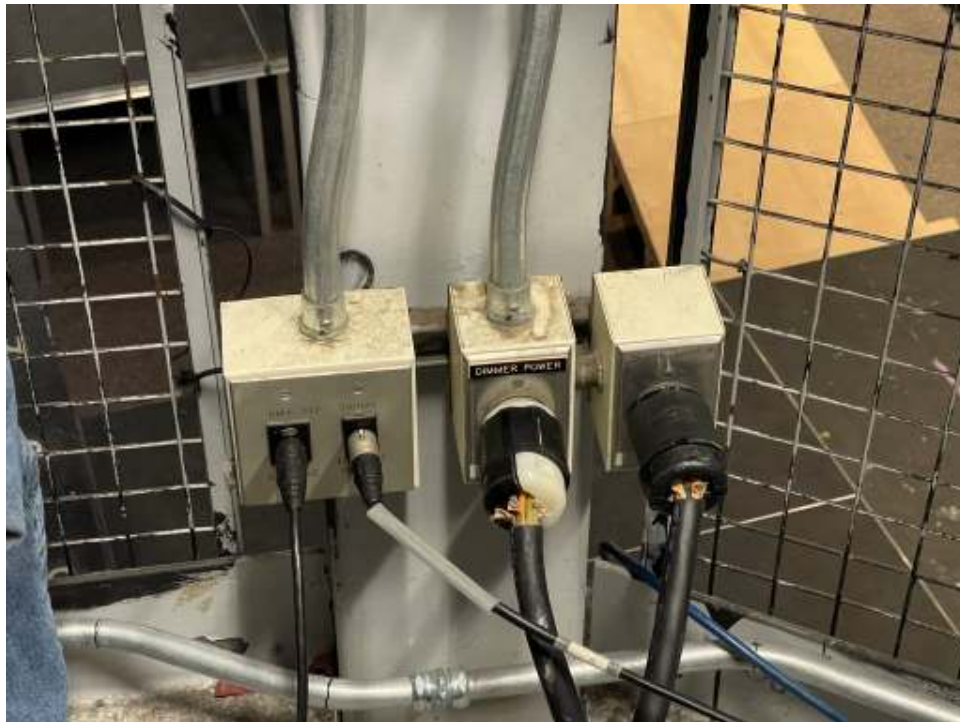
The stage electrics are powered by six circuit dimmer bars located in one position on each electric. All cabling on these 56' long electrics has to be routed down the pipe to these locations. There is ineffective cable management from the ceiling which is not located at the end of the pipe. The current configuration limits the number of circuits available on each pipe.



Recommendation: Replace the distribution, cable management and multicable with new full length connector strips, providing additional circuits and DMX control across the length of the pipe. If the intent is to motorize these electrics, provide hoist systems with integrated cable management.

H.) Dimming System

The dimming system is designed with no central dimming, except for house light dimming (addressed below). Six circuit dimmer bars are positioned throughout the space with cabling required from most positions to reach the dimmer bars. Many of the dimmer bars have connectors with strain reliefs not correctly maintained.



Many areas have dimmer bars that are not mounted. Many of the dimmer bars are located in areas that could be considered unsafe, either in terms of access to those areas or in terms of positioning to maintain safe operation and space for heat dissipation.



Recommendation: Dimming system wiring should be replaced with adequate circuits designed for an LED system. Relay racks should be supplied to allow for LED fixtures to be turned off when not in use, conserving electricity. Power distribution should be redesigned, replaced, and configured for efficient use to minimize extraneous cabling as much as possible, facilitating and speeding up deployment of new lighting plots.

I.) Control System

Lighting control console is an ETC Ion, which is a current product, and is adequate for control of an updated LED lighting system.



DMX distribution is outdated and not designed for the needs of a modern LED lighting system. Existing DMX outlets depend on jumping through to the next outlet to complete the run, making troubleshooting difficult.



Recommendation: Update DMX control distribution system to modern networking equipment and cabling. Provide control locations at all fixture hanging positions. Control locations should be addressable to facilitate system setup.

J.) House Light System

The auditorium house light system is barely functional. A number of attempts have been made to bolster the system, resulting in control issues. The house light dimming system is obsolete. Many of the control stations are inoperable.





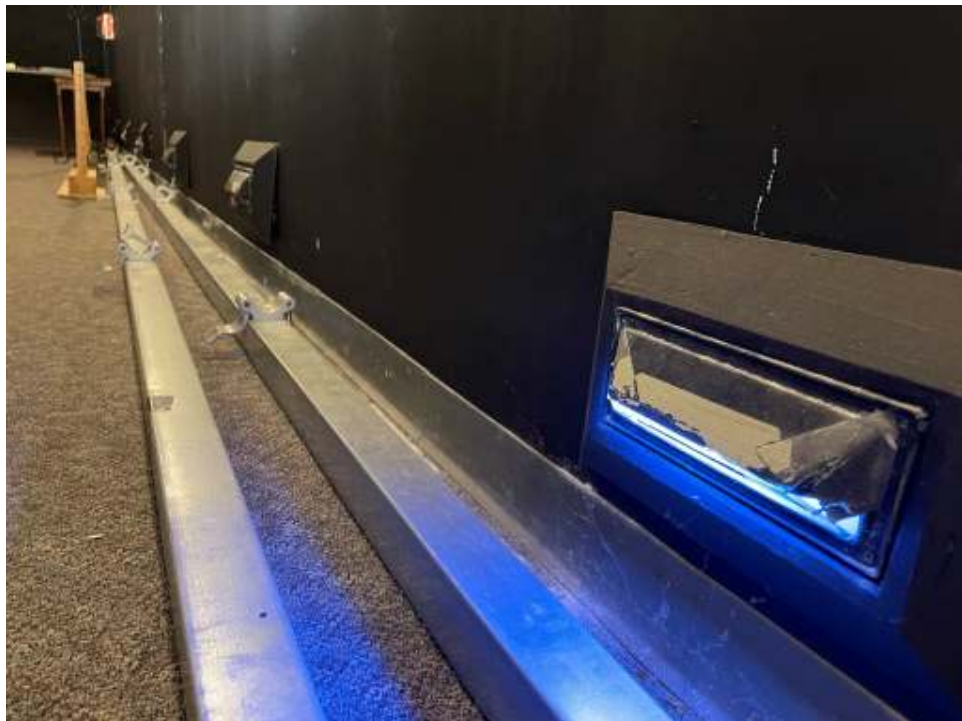
Some house light fixtures are not connected to the lighting system at all, and therefore not controllable for performances. Many of the house light fixtures need new lamps. A pendant fly system is required to reach some of the fixtures for re-lamping.



Many areas of the house are dark, because of nonfunctioning house lights.



Aisle lighting and safety lighting is in disrepair or not working.



Detrimental glare from side sconces.



Recommendation: The house light system should be replaced in its entirety, with the dimmer units replaced by relay panels. The house lighting fixtures should be replaced with DMX controlled LED fixtures, uniform in type throughout the space to provide adequate levels of light to maintain safe egress. Pendant winches should no longer be needed, as lamp replacement should be minimal.

New house light controls, compatible with the new house lighting system, should be provided at all entry points, and touch screens should be located in the control booth and backstage at a stage managers position to provide the ability to have limited control of the lighting without having to use the lighting control console.

Aisle lighting and egress lighting should be updated to provide adequate access into and out of the space when the house lights are down for performance.

K.) Theatrical Lighting Fixtures

There is a combination of mostly conventional fixtures and some LED fixtures. Most of the conventional fixtures are approximately 15-30 years old. Many are in disrepair. With the current popularity of LED fixtures, lamps for these fixtures are being discontinued by some manufacturers, and they are getting harder to source. It is anticipated that this trend will continue into the future.





Recommendation: Replace all of the non-LED fixtures with new LED fixtures. Add some automated lighting fixtures. Provide new cabling for power and control to accommodate the new system. Inventory accessories and provide additional accessories, if needed. Add automated fixtures to improve flexibility and performance.

New LED fixtures will reduce electricity usage by 50-75% or more. In addition, HVAC load will be significantly reduced. Expendables such as lamps and gel will no longer be needed. New functions, such as color changing and automated lighting will add to the performance of the fixtures.

L.) Work Light

Work light over the stage is insufficient for production work. Work lights on the catwalk and side galleries need new lamps or electrical maintenance. Index lights on the fly rail have lamps burnt out or fixtures need repair.



Recommendation: Work lights should be provided on the electrics for lighting the stage area to build scenery, etc. Additional high work lights to enable visibility of the rigging would also be an improvement. Replace and /or repair work lights on the catwalk and in the tech galleries. Index lights on fly rail need replacement lamps or should be updated to LED.

M.) Housekeeping, Safety

There are numerous housekeeping, maintenance, and code issues throughout the space.





Recommendation: The space needs a thorough cleaning and the loose equipment needs to be stored properly and inventoried. At a minimum, maintenance work for the system should be addressed as soon as possible.

III.) Conclusion:

The Staples High School auditorium could be a premier theater in the area provided:

- 1) Safety issues are corrected as soon as possible.
- 2) The theater systems are updated, including audio, lighting, and rigging systems.
- 3) Maintenance is done both from a technical standpoint and a cosmetic standpoint.
- 4) Technical personnel are hired and trained to maintain the theater once the work has been completed.

Several approaches to improving the space could be considered.

One approach would be to do the maintenance required to restore the systems to their original functions. Considering the current condition of the theater, this might prove to be a costly endeavor. This would leave the theater with working systems, but the original designs took approaches not usually found in modern theaters today.

Over the years, there have been multiple attempts to reconfigure, add to, and bypass different parts of the system, resulting in cables being run all over the facility, electrical boxes left without covers, abandoned conduits, and multiple layers of attempted repairs.

The stage lighting system is in fair to poor condition, and most of the current equipment is no longer manufactured. The system design relies upon outdated concepts, with local dimmer bars at various locations. The dimmer bars intended to control the conventional lighting have been relocated, discarded, and left in different areas of the theater, making it difficult to know what is in use and what has been abandoned. Troubleshooting the system would prove to be difficult at best.

The system design requires extensive cabling, instead of having circuits and control points available at lighting positions throughout the theater. There is temporary cabling being used as permanent wiring in many areas, and flexibility is limited by the system design.

A DMX control system is present, but it does not incorporate modern distribution or networking capabilities.

There are numerous code issues throughout the space. Much of the lighting equipment is either not functioning, or it needs repair. Work lighting is inadequate for production work in the space.

The house lighting system needs repair and or replacement, with many of the controls and fixtures inoperable or unable to be controlled by the lighting system. Updating the house lighting system and work lights in the space could be done to address life safety issues as a priority.

Doing a full upgrade to LED systems for the stage lighting and house lighting is recommended, and it could be done in conjunction with repairs and upgrades to the rigging systems. Conventional fixtures in good condition could be repurposed for the black box theater, which has an appropriate dimming system and still uses conventional fixtures. It may be possible to approach the renovation in phases, once the school's priorities are established.

New LED fixtures will reduce electricity usage by 50-75% or more. The HVAC load in the space will be significantly reduced. Expendables such as lamps and gel will no longer be needed. Maintenance functions, such as changing out house light lamps, will be significantly reduced.

The new LED fixtures will have increased capabilities, such as color changing and effects, and automated lighting will add to the performance of the fixtures.

LED fixtures eliminate the need for dimming, as intensity control is handled by the control system. Relay panels should be installed to minimize electrical usage when the space is not being utilized.

New power distribution should be designed to minimize cabling, provide DMX control where it is needed, and make it generally easier, safer, and faster to set up.

The DMX control system needs to be totally revamped to provide a coherent control system that makes sense and can be troubleshooted. The control system should be updated to a fully modern networked system.

Demolition prior to updates should include removal of abandoned or unused electrical components that do not meet the current electrical code. System components that are not compatible with an updated system should also be removed.

The school does several large productions each year. The space is larger than most high school theaters, and with updated systems would be capable of staging productions that rival most other high school and university productions in the area. With proper supervision, the updated facility would most likely generate demand as a rental space.