



# Safety Inspection Report

## Staples High School

Auditorium  
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Westport, CT 06880



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Primos, PA 19018

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Requested By: Steve Hamelin  
Inspection Date: September 22, 2022  
Inspector: Stu Cox



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## Statement of Purpose

Rigging inspections are conducted by Sapsis Rigging, Inc. to help make performance spaces a safer place to work, perform and visit.

We conduct our inspections using the following criteria:

- Manufacturer specifications
- Nation Building, Fire and Safety Codes
- OSHA Regulations
- Recognized standards from independent testing organizations
- ANSI
- Common sense.

A professional rigging inspection should be conducted on an annual basis. To further reduce the likelihood of accidents, these inspections should be part of a well-documented, ongoing maintenance program incorporating all areas of the performance facility.

## Structural Report

As a service to the client, Sapsis Rigging, Inc. will visually inspect, where possible, the support structure of the stage area. However, Sapsis Rigging, Inc. shall not be held responsible for any/all structural members in the facility. If, in the inspector's opinion, a problem exists, or if the client has any questions or concerns regarding any support member in the facility, we strongly recommend that a professional engineer be retained to make the necessary evaluations.

## **General Description**

This is a proscenium theater. The onstage rigging systems consist of:

- Eleven (11) double purchase, J-track guided, counterweight line sets.
- Two (2) single purchase, J-track guided, counterweight line sets.
- Four (4) tripping line sets, disabled.
- Five (5) spot rope blocks.
- A lighting box truss on three (3) chain hoists.
- A dead hung projection screen under the proscenium, disabled.
- Two (2) dead hung battens.
- Three (3) dead hung traveler tracks.
- Two (2) dead hung side tab traveler tracks.
- A fly gallery, stage left.

The locking rail is located stage left on the fly gallery. The loft blocks are underhung from the building steel. There is no grid.

The front-of-house (FOH) rigging systems consist of:

- A dead hung valance.
- A lighting box truss on three (3) chain hoists.
- A catwalk lighting position.
- Eight (8) horizontal side lighting positions.
- Six (6) vertical side lighting positions.
- A balcony railing used as a lighting position.
- Two (2) back-of-house (BOH) lighting positions.
- Two (2) pipe mounted speakers.
- Two (2) post mounted speakers.

The theater is used for High School functions and productions.

**Note:** References in this report to **E1.4-1-2016** refer to the current ANSI Standard for **Manual Counterweight Rigging Systems**.

## **1. Fire Safety**

- 1.1. High visibility signs should be placed above all onstage and catwalk fire extinguishers to make them easier to locate in the event of an emergency. **Photos 1, 2, 3 & 4**

- 1.2. The pathways to all fire extinguishers should be kept clear at all times. **Photos 1 & 2**
- 1.3. Flame retardancy certificates for the stage curtains were not available at the time of this inspection. There are labels on the curtains, however, that show a fabrication date of February 2019 and denote inherently flame-retardant materials. **Photos 5 & 6**

## 2. General Building Safety

- 2.1. Access to the fly gallery ladder should be kept clear of all equipment and debris. **Photo 7**
- 2.2. There is a junction box on the fly gallery with a missing cover. **Photo 8**
- 2.3. The plastic frame clipped overhead of the fly gallery should be removed. **Photo 9**
- 2.4. All legacy or unused rigging equipment should be removed over stage and in the FOH. **Photos 10, 11, 12 & 13**
- 2.5. The index lighting strip over the locking rail has broken and missing bulbs. **Photo 14**

## 3. Fall Protection Safety

- 3.1. Personal fall protection systems are needed in the following locations:
  - 3.1.1. The FOH side lighting positions. **Photos 15, 16 & 17**
  - 3.1.2. The top of the fly gallery access ladder. **Photo 18**
  - 3.1.3. The stage right and stage left access ladders. **Photos 19 & 20**
  - 3.1.4. The top of the stage right and stage left catwalk access ladders. **Photos 21 & 22**
  - 3.1.5. The BOH lighting positions. **Photos 23 & 24**

- 3.2. The hatch covers for the access ladders to FOH side lighting positions are heavy and difficult to operate. **Photos 25 & 26**

## 4. Structural

- 4.1. There were no obvious problems noted during this inspection. A professional engineer should address any questions concerning structural members in this facility.

## 5. Fire Safety Curtain

- 5.1. The fire safety curtain has been removed. The Sure-Guard II release is still in place and should be removed. **Photo 27**

## 6. Stage Rigging - Manual Counterweight Line Sets

- 6.1. The fly gallery and locking rail should be kept clear of all unnecessary equipment and supplies. **Photos 28 & 29**
- 6.2. The counterweight stacks are too high. Stacks of counterweight should not exceed 1' in height and should be neatly cross stacked. This will help prevent foot injuries from falling counterweights. **Photo 30**
- 6.3. The wooden pin rail on the fly gallery is not suitable for securing overhead loads. **Photo 31**
- 6.4. The rope locks have the following problems:
  - 6.4.1. Several of the rope locks need adjustment. The locking mechanism should engage the rope and support a load of 50 pounds without damage to the rope.
  - 6.4.2. Several of the locking nuts on the adjustment screws are loose. These nuts should be tight to prevent the adjustment screws from loosening during use. **Photo 32**
  - 6.4.3. The tensioning thumbscrew of the #3 rope lock has broken off. **Photo 33**

6.5. The tension blocks have the following problems:

6.5.1. All counterweights should be removed from under the locking rail to prevent interference with the operation of the tension blocks. **Photo 34**

6.5.2. The tension blocks on several linesets are either close to landing or have landed. The tension blocks should be raised to the midway point in their guide tracks and the purchase lines should be trimmed to prevent the purchase lines from going slack. **Photo 35**

6.5.3. Wire mesh has been installed under the locking rail. This does not allow for proper operation of the tension blocks. **Photo 36**

6.6. The counterweight arbors have the following problems:

6.6.1. The locking collars are raised out of position on several line sets. These collars prevent the counterweights from being forced out of the arbors in the event of an out of balance accident. These collars should be tightened down on top of the weight stack at all times. **Photo 37**

6.6.2. The locking collar thumbscrews are loose on several line sets. These collars prevent the counterweights from being forced out of the arbors in the event of an out of balance accident. These collars should be tightened down on top of the weight stack at all times.

6.6.3. The backplates of the arbors should be labeled every 2 vertical feet per E1.4-1 2016 sec 3.7.7.3 to aid in placement of the spreader plates when loading counterweight.

6.6.4. The spreader plates are used incorrectly on some line sets. Current industry standards call for a spreader plate for every 2 vertical feet of counterweight. The spreader plates prevent the arbor rods from bowing and releasing the counterweights in the event of a hard landing. **Photo 38**

- 6.6.5. The spreader plates are tied up on several line sets. The spreader plates prevent the arbor rods from bowing and should be properly located in the arbor counterweight stack. **Photo 39**
- 6.7. The purchase lines are showing signs of wear. These lines should be replaced. **Photo 40**
- 6.8. There is slack in all of the purchase lines. The purchase lines should be re-trimmed. **Photo 35**
- 6.9. Some of the lift lines are running over an insulated pipe. The lift lines are cutting through the insulation. **Photo 41**
- 6.10. The lift line terminations have the following problems:
  - 6.10.1. The shackles at the head block lift line terminations require safety wires to prevent them from loosening. **Photo 42**
  - 6.10.2. The shackles at the arbor lift line terminations require safety wires to prevent them from loosening. **Photo 43**
  - 6.10.3. The hex nuts on the forged wire rope clips at the lift line terminations should be checked and tightened to the proper torque as required by the manufacturer. The torque setting for 1/4" diameter wire rope clips is 15 ft. pounds. **Photo 44**
  - 6.10.4. Malleable wire rope clips are used at the lift line terminations. Manufacturer specifications do not certify malleable wire rope clips for overhead lifting. Drop forged wire rope clips or copper compression sleeves should be used at these terminations. **Photos 45 & 46**
  - 6.10.5. There is only one wire rope clip at some of the lift line and cable cradle terminations. Manufacturer specifications require at least 2 properly spaced wire rope clips on all terminations. **Photos 46 & 47**

6.11. The trim chains have the following problems:

6.11.1. Many of the trim chains are wrapped incorrectly around the battens, creating a crushing force on the chains. The trim chains should be wrapped around the battens without crossing over top of themselves. [Photos 48 & 49](#)

6.11.2. The trim chain shackle is not dressed properly, placing a side load on the shackle. [Photo 50](#)

6.11.3. The trim chains have captured the conduit on the electric's batten. [Photo 51](#)

6.11.4. All screw pin anchor shackles, system wide, require safety wires to prevent them from loosening. [Photos 48, 49, 51 & 52](#)

6.12. The rope line set head blocks are mounted to Unistrut® track that is clipped to the I-beams in line with the resultant force, potentially allowing the Unistrut® and attached blocks to slide onstage when under load. [Photo 53](#)

6.13. The tripping line sets have the following problems:

6.13.1. There are no thimbles in some of the lift line termination eyes. Thimbles are required to prevent damage to the wire rope caused by the sharp bend of the eye. [Photo 54](#)

6.13.2. All turnbuckles, system wide, require a safety wire to prevent them from loosening. [Photo 55](#)

6.13.3. All screw pin anchor shackles, system wide, require safety wires to prevent them from loosening. [Photo 56](#)

6.13.4. C-clamp style beam clamps are supporting the shop-made mule blocks. These cast clamps are not designed to support significant loads overhead. They can also loosen and become dislodged. A load rated beam clamp or custom hanging clamp would be preferable in this situation. [Photo 57](#)

## 7. Stage Rigging - Lighting Trusses

- 7.1. All screw pin anchor shackles require safety wires to prevent them from loosening. **Photos 58 & 59**
- 7.2. Maintenance and inspection records were not available for the chain hoists at the time of this inspection. Logbooks should be kept for this equipment to facilitate future work and satisfy OSHA requirements.

## 8. Stage Rigging - Dead Hung Battens and Tracks

- 8.1. The beam clamps are not wide enough for the I-Beams.  
**Photo 60**
- 8.2. The chains wrap the Unistrut®. Wrapping the Unistrut® with chain in this manner places a side load on individual chain links. The chain is not designed for this condition. The chains should terminate to through bolted drop forged shouldered eyebolts. **Photo 61**
- 8.3. All turnbuckles, system wide, require safety wires to prevent them from loosening. **Photos 62 & 63**
- 8.4. The turnbuckles have standard hex nuts installed on the jaw end bolts. The standard hex nuts should be replaced with a locking nut such as a nylon insert nut. **Photos 62, 63 & 64**
- 8.5. The dead-end of the supporting chain is trapped in a rotated link at the shackle termination at several locations. The dead-end should be clear of the load path from the live chain load to shackle.  
**Photo 65**
- 8.6. The chain terminates to the batten clamp with a grade-5 bolt. Bolts, when used as a termination device for chain, do not support the load appropriately. This connection should be changed to a batten clamp and shackle assembly. **Photo 66**
- 8.7. All screw pin anchor shackles, system wide, require safety wires to prevent them from loosening. **Photos 60 & 67**

## 9. Projection Screen

- 9.1. S-hooks are used to suspend the projection screen housing. The S-hooks are not rated for overhead suspension. Only load rated hardware and fittings should be used. **Photos 68, 69 & 70**
- 9.2. The S-hook is placed over the chain link sideways. Rigged in this manner, the S-hook places a side load on individual chain links. The chain is not designed for this condition. **Photo 69**
- 9.3. The projection screen has been removed from the housing. The housing and its rigging should be removed. **Photo 68**

## 10. Front-of-House (FOH)

- 10.1. The valance is supported by eyebolts connected to Unistrut® by Unistrut® nuts. Unistrut® nuts are not recommended as there is no way to ensure the hex nuts stay tight. **Photo 71**
- 10.2. The catwalk tag line rigging has the following problems:
  - 10.2.1. The pipe structure uses threaded cast iron plumbing fittings. These fittings are not load rated for this application and can fail without warning. **Photo 72**
  - 10.2.2. Malleable wire rope clips are used at the wire rope terminations. Manufacturer specifications do not certify malleable wire rope clips for overhead lifting. Drop forged wire rope clips or copper compression sleeves should be used at these terminations. **Photo 73**
  - 10.2.3. There are no thimbles in the wire rope termination eyes. Thimbles are required to prevent damage to the wire rope caused by the sharp bend of the eye. **Photo 73**
  - 10.2.4. The wire rope wraps the pipe. Wrapping the wire rope around the pipe places strain on the wire rope clips. **Photo 73**

## **Summary**

The problems in this report should be addressed as soon as possible. In addition, a fully documented maintenance plan should be put into effect. This plan, along with regular inspections, will not only help ensure the safety of all that use this facility, but also prolong the life of the equipment.

## **End of Report**