



**Larson & Darby Group**

Architecture Engineering Interiors

## PROJECT MANUAL

STAGE CURTAIN & RIGGING PROJECT AT WASHINGTON, LINCOLN,  
EAST, GUILFORD, & JEFFERSON SCHOOLS

**ROCKFORD PUBLIC SCHOOLS 205**

ROCKFORD, ILLINOIS

Washington Elementary School – 1421 West Street, Rockford, IL

Lincoln Middle School - 1500 Charles Street, Rockford, IL

East High School – 2929 Charles Street, Rockford, IL

Guilford High School – 5620 Spring Creek Road, Rockford, IL

Jefferson High School – 4145 Samuelson Road, Rockford, IL

PROJECT MANUAL

FOR

STAGE CURTAIN & RIGGING PROJECT AT WASHINGTON, LINCOLN, EAST,  
GUILFORD, & JEFFERSON SCHOOLS  
ROCKFORD PUBLIC SCHOOLS 205  
ROCKFORD, ILLINOIS

RPS PROJECT NO: 2021; IFB 20-40

LDG PROJECT NO. 30068

DATE: March 24, 2020

LARSON & DARBY GROUP  
4949 HARRISON AVENUE, SUITE 100  
Illinois Design Firm Registration Number: 184-000280

ARCHITECTURE-ENGINEERING-INTERIORS  
ROCKFORD, ILLINOIS 61108

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CHRISTOPHER W. ANDERSON

Licensed Architect

LIC. EXPIRES: 11/30/2020

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Date

STAGE CURTAIN & RIGGING PROJECT AT WASHINGTON, LINCOLN, EAST, GUILFORD, &  
JEFFERSON SCHOOLS  
ROCKFORD PUBLIC SCHOOLS 205  
ROCKFORD, ILLINOIS

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**BID OFFER FORM**

Bid # 20-40 STAGE CURTAIN & RIGGING PROJECT AT WASHINGTON, LINCOLN, EAST, GUILFORD, & JEFFERSON SCHOOLS, for ROCKFORD PUBLIC SCHOOLS DISTRICT 205.

BID SUBMITTED BY: \_\_\_\_\_

Date: April 30, 2020

The undersigned, having become familiar with the local conditions affecting cost of work and with the Bidding Documents, including the advertisement of the Invitation for Bid, the Instructions and Supplementary Instructions to Bidders, this Bid Offer Form, the General and Supplementary Conditions, the Drawings and Specifications, and Addenda issued thereto, as prepared and issued by the Board of Education of Rockford School District No. 205, Winnebago and Boone Counties, Illinois hereby agrees to furnish all labor, material and equipment necessary to do the Work required for the project and IFB identified above, for the amount shown below:

**Note: Contractor to write "No Bid" in the dollar amount section for any line items not bid.**

**BASE BID:**

A. WASHINGTON ELEMENTARY SCHOOL:

TOTAL: \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

B. LINCOLN MIDDLE SCHOOL:

TOTAL: \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

C. EAST HIGH SCHOOL:

TOTAL: \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

D. GUILFORD HIGH SCHOOL:

TOTAL: \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

E. JEFFERSON HIGH SCHOOL:

TOTAL: \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

**TOTAL ALL:**

\_\_\_\_\_  
**DOLLARS(\$ \_\_\_\_\_)**

**BID OFFER FORM**

**ALTERNATE BIDS:**

State the amount to be added to or deducted from the Base Bid when Work shown or specified Under the Alternate Bids is accepted and incorporated in the Contract.

**ALTERNATE BID NO. 1:** Replace all stage curtains and curtain rigging at Washington Elementary School as per the Basis of Design materials and fabrication methods indicated in Specifications. Base bid: Do not replace stage curtains and curtain rigging. Alternate bid: Replace all stage curtains and curtain rigging.

TOTAL: \_\_\_\_\_ DOLLARS (\$ \_\_\_\_\_)

**ADDENDA RECEIVED**

The undersigned acknowledges receipt of Addenda \_\_\_\_ to \_\_\_\_ inclusive.

**PRE-BID MEETING ATTENDANCE**

A Bidder representative attended the Pre-Bid Meeting? YES \_\_\_\_\_ OR No \_\_\_\_\_.

**SITE VISIT**

Existing premises and conditions were checked by an on-site inspection on \_\_\_\_\_.

**CONTRACTOR'S QUALIFICATION STATEMENT**

A fully completed AIA Document A305-1986 Contractor's Qualification Statement is **required** AND MUST BE SUBMITTED WITH THE BID. Include at least three references from projects completed in the past five (5) years with phone number, date of completion, description of work, and project architect (or engineer) contact name with phone number. Projects must be similar to the scope of this bid, and the bidder must have acted in the capacity of prime or general contractor.

Contractor has adequate equipment to perform the work properly and expeditiously: \_\_\_Yes \_\_\_No.

**COMMENCEMENT AND COMPLETION OF CONTRACT**

The undersigned agrees, if awarded the Contract, to commence the contract work within five (5) days of receipt of Order to Proceed or if required, upon execution of a formal written contract and to complete said Work within the specified completion time. The undersigned further agrees to execute the Contract, furnish satisfactory performance and payment bond as well as insurance coverage, as specified in strict accordance with the Contract Documents.

Date of Commencement of Construction: **May 13, 2020**

Date of Substantial Completion: August 21st, 2020

Date of Final Completion: August 28th, 2020

BIDDER: \_\_\_\_\_  
(Corporation) (Partnership) (Individual) Circle One

Address \_\_\_\_\_  
Street \_\_\_\_\_  
City State Zip Code \_\_\_\_\_

**BID OFFER FORM**

Phone No. \_\_\_\_\_

Email address \_\_\_\_\_

BIDDER FEIN/SSN NO. \_\_\_\_\_

By: \_\_\_\_\_  
Bidder or Authorized Agent Signature Print name

Title: \_\_\_\_\_

Subscribed and sworn to before this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_

**BID DEPOSIT CERTIFICATION**

A Bid Deposit is required in the amount of 5% of the total Bid including Alternate Bids. This Bid Deposit is to be a Bid Bond, Bank Draft or Certified Check made payable to the "Rockford School District No. 205", as a guarantee that if awarded all or part of the Bid, the firm will enter into a contract to perform with the Board of Education.

Amount of Total Bid \$ \_\_\_\_\_

Amount of Bank draft or Certified Check \$ \_\_\_\_\_

BIDDER: \_\_\_\_\_

\_\_\_\_\_  
Signature of Bidder or Authorized Agent

**SUBCONTRACTOR LISTING**

1. Pursuant to bidding requirements for the Work:  
The Bidder, for portions of the Work equaling or exceeding 1/2 of 1% of the total Contract Sum, proposes to use the following Subcontractors. The Bidder proposes to perform all other portions of the Work with its own forces. The District reserves the right to qualify all Subcontractors. **COPY AND ATTACH ADDITIONAL SHEETS AS NECESSARY.**

<u>Portion of the Work</u>	<u>Subcontractor Name and Address</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

**BID OFFER FORM**


Bidder:

\_\_\_\_\_

By: \_\_\_\_\_  
Bidder or Authorized Agent Signature

-END OF BID OFFER FORM-

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DOCUMENT 007300 – SUPPLEMENTARY CONDITIONS

1. CHANGE ORDER MARK-UPS: Add the following to provisions regarding Change Order markups in the Conditions of the Contract:
  - A. The combined overhead and profit included in the total cost to the Owner for a change in the Work shall be based on the following schedule:
    - .1 For the Contractor, for Work performed by the Contractor's own forces, twelve percent (12%) of the cost.
    - .2 For the Contractor, for Work performed by the Contractor's Subcontractors, five percent (5%) of the amount due the Subcontractors.
    - .3 For each Subcontractor involved, for Work performed by that Subcontractor's own forces, twelve percent (12%) of the cost.
    - .4 For each Subcontractor involved, for Work performed by the Subcontractor's Subcontractors, five percent (5%) of the amount due the Sub-subcontractor.
    - .5 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed above. Where major cost items are Subcontracts, they shall be itemized also.

END OF DOCUMENT 007300



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SECTION 01 10 00 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY OF WORK

- A. Project: Theatrical Rigging Improvements and Curtain Replacements, East, Jefferson, Guilford, Lincoln, and Washington Schools.
- B. Owner: Rockford Public Schools District 205.
- C. The Work includes but is not limited to the following:
  - 1. Theatrical rigging improvements and new stage curtains.
- D. Work Under Other Contracts:
  - 1. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract or other contracts. Coordinate the Work of this Contract with work performed under separate contracts.

1.2 WORK RESTRICTIONS

- A. Contractor's Use of Premises: During construction, Contractor will have limited use of site and building indicated.
  - 1. Owner will occupy premises during construction. Perform construction during normal working hours (7 AM to 4 PM Monday thru Friday, other than holidays), unless otherwise agreed to in advance by Owner. Clean up work areas and return to a useable condition at the end of each work period.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 10 00

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SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 ALLOWANCES

- A. Allowances shall include cost to Contractor of specific products and materials ordered by Owner under allowance and shall include taxes, freight, and delivery to Project site. Allowances are specified in the Bid Form.
- B. Obtain three proposals for each allowance and submit to Architect with recommendations. Purchase products and systems selected by Owner.
- C. Advise Architect of the date when selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- D. Submit invoices to show cost of products furnished under each allowance. Reconciliation of Allowance amounts with actual costs will be by Change Order.

1.2 ALTERNATES

- A. An alternate is an amount proposed by bidder for certain work that may be added to or deducted from the Base Bid amount if Owner accepts the Alternate. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate the Alternate into the Work. No other adjustments are made to the Contract Sum. B. Alternates are specified in the Bid Form.

1.3 UNIT PRICES

- A. A unit price is an amount proposed by bidders and stated on the Bid Form as a price per unit of measurement for work added to or deducted from the Contract Sum by appropriate modification, if estimated quantities of Work required by the Contract Documents are increased or decreased. Unit prices are specified in the Bid Form.
- B. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, and profit.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 20 00

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SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 PROJECT MANAGEMENT AND COORDINATION

- A. Coordinate construction to ensure efficient and orderly installation of each part of the Work.
- B. Schedule and conduct progress meetings at Project site at regular intervals. Notify Owner and Architect of meeting dates and times. Require attendance of each subcontractor or other entity concerned with current progress or involved with planning or coordination of future activities.
  - 1. Record minutes and distribute to everyone concerned, including Owner and Architect.

1.2 SUBMITTAL PROCEDURES

- A. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
  - 1. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
  - 2. Prepare submittals as PDF packages and transmit to Architect by email.
    - 1 Email Address: DocumentAdmin@Larsondarby.com.
    - 2 Architect will annotate PDF submittal and return.
  - 3. Architect will return submittals, without review, received from sources other than Contractor.
- B. Place a permanent label or title block on each submittal for identification. Provide a space approximately 6 by 8 inches on label or beside title block to record Contractor's review and approval markings and action taken by Architect. Include the following information on the label:
  - 1. Project name.
  - 2. Date.
  - 3. Name and address of Contractor.
  - 4. Name and address of subcontractor or supplier.
  - 5. Number and title of appropriate Specification Section.
- C. Identify deviations from the Contract Documents on submittals.
- D. Contractor's Construction Schedule Submittal Procedure: Submit two copies of schedule within 10 working days after date established for Commencement of the Work.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

- A. Product Data: Mark each copy to show applicable products and options. Include the following:
  - 1. Manufacturer's written recommendations, product specifications, and installation instructions.
  - 2. Testing by recognized testing agency.
  - 3. Compliance with specified standards and requirements.

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- B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data. Submit on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches. Include the following:
  - 1. Dimensions and identification of products.
  - 2. Fabrication and installation drawings and roughing-in and setting diagrams.
- C. Samples: Submit Samples for review of kind, color, pattern, and texture and for a comparison of these characteristics between submittal and actual component as delivered and installed. Include name of manufacturer and product name on label.
  - 1. If variation is inherent in material or product, submit at least three sets of paired units that show variations.

## 2.2 INFORMATION SUBMITTALS

- A. Qualification Data: Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- B. Product Certificates: Prepare written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

## 2.3 DELEGATED DESIGN

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
  - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit three copies of a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
  - 1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

## 2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal Gantt-chart-type schedule within 10 days of date established for the Notice of Award.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

## PART 3 - EXECUTION

### 3.1 SUBMITTAL REVIEW

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- A. Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.
- B. Architect will review each action submittal, make marks to indicate corrections or modifications required, stamp and mark as appropriate to indicate action taken, and return.

3.2 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Distribute copies of approved schedule to Owner, Architect, subcontractors, testing and inspecting agencies, and parties identified by Contractor with a need-to-know schedule responsibility. When revisions are made, distribute updated schedules to the same parties.
- B. Updating: At monthly intervals, update schedule to reflect actual construction progress and activities.
  - 1. As the Work progresses, indicate Actual Completion percentage for each activity.

END OF SECTION 01 30 00

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SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. Use Charges: Cost or use charges for temporary facilities shall be included in the Contract Sum.
- B. Use water and electric power from Owner's existing system without metering and without payment of use charges.
- C. Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 TEMPORARY UTILITIES

- A. Sanitary Facilities: Contractor may use existing toilets when the building is not occupied by students.

3.2 TEMPORARY SUPPORT FACILITIES

- A. Provide waste-collection containers in sizes adequate to handle waste from construction operations. Collect waste daily and, when containers are full, legally dispose of waste off-site. Comply with requirements of authorities having jurisdiction.
- B. Install project identification and other signs in locations approved by Owner to inform the public and persons seeking entrance to Project.

3.3 TEMPORARY SECURITY AND PROTECTION FACILITIES

- A. Provide temporary environmental protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

END OF SECTION 01 50 00

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SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

- A. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
- B. Product Substitutions: Substitutions include changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor after award of the Contract.
  - 1. Submit three copies of each request for product substitution.
  - 2. Submit requests within ten days after the Notice of Award.
  - 3. Do not submit unapproved substitutions on Shop Drawings or other submittals.
  - 4. Identify product to be replaced and show compliance with requirements for substitutions. Include a detailed comparison of significant qualities of proposed substitution with those of the Work specified, a list of changes needed to other parts of the Work required to accommodate proposed substitution, and any proposed changes in the Contract Sum or the Contract Time should the substitution be accepted.
  - 5. Architect will review the proposed substitution and notify Contractor of its acceptance or rejection.
- C. Comparable Product Requests:
  - 1. Submit three copies of each request for comparable product. Do not submit unapproved products on Shop Drawings or other submittals.
  - 2. Identify product to be replaced and show compliance with requirements for comparable product requests. Include a detailed comparison of significant qualities of proposed substitution with those of the Work specified.
  - 3. Architect will review the proposed product and notify Contractor of its acceptance or rejection.
- D. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.
  - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
  - 2. Deliver products to Project site in manufacturer's original sealed container or packaging, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
  - 3. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
  - 4. Store materials in a manner that will not endanger Project structure.
  - 5. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- E. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

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PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

- A. Provide products that comply with the Contract Documents, are undamaged, and are new at the time of installation.
  - 1. Provide products complete with accessories, trim, finish, and other devices and components needed for a complete installation and the intended use and effect.
  - 2. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.
  
- B. Product Selection Procedures:
  - 1. Where Specifications name a single product or manufacturer, provide the item indicated that complies with requirements, or Owner-approved equal.
  - 2. Where Specifications include a list of names of products or manufacturers, provide one of the items indicated that complies with requirements, or Owner-approved equal.
  - 3. Where Specifications include a list of names of products or manufacturers, accompanied by the term "available products" or "available manufacturers," provide one of the named items that complies with requirements, or Owner-approved equal. Comply with provisions for "comparable product requests" for consideration of an unnamed product.
  - 4. Where Specifications name a product as the "basis-of-design" and include a list of manufacturers, provide the named product, or Owner-approved equal. Comply with provisions for "comparable product requests" for consideration of an unnamed product by the other named manufacturers.
  - 5. Where Specifications name a single product as the "basis-of-design" and no other manufacturers are named, provide the named product or Owner-approved equal. Comply with provisions for "comparable product requests" for consideration of an unnamed product by another manufacturer.
  
- C. Unless otherwise indicated, Architect will select color, pattern, and texture of each product from manufacturer's full range of options that includes both standard and premium items.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01 60 00



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SECTION 01 70 00 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 - GENERAL

1.1 CLOSEOUT SUBMITTALS

- A. Record Drawings: Maintain a set of prints of the Contract Drawings as Record Drawings. Mark to show actual installation where installation varies from that shown originally.
  - 1. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
- B. Operation and Maintenance Data: Submit one copy of manual. Organize data into three-ring binders with identification on front and spine of each binder, and envelopes for folded drawings. Include the following:
  - 1. Manufacturer's operation and maintenance documentation.
  - 2. Video on CD or flashdrive of training seminar for Owner use.
  - 3. Maintenance and service schedules.
  - 4. Maintenance service contracts.
  - 5. Emergency instructions.
  - 6. Spare parts list.
  - 7. Copies of warranties.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Examine substrates and conditions for compliance with manufacturer's written requirements including, but not limited to, surfaces that are sound, level, plumb, smooth, clean, and free of deleterious substances; substrates within installation tolerances; and application conditions within environmental limits. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Before proceeding to lay out the Work, verify layout information shown on Drawings.
- C. Take field measurements as required to fit the Work properly. Where fabricated products are to be fitted to other construction, verify dimensions by field measurement before fabrication and, when possible, allow for fitting and trimming during installation.

3.2 CUTTING AND PATCHING

- A. Do not cut structural members or operational elements without prior written approval of Architect.
- B. Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.
- C. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.

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3.3 INSTALLATION

- A. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Comply with manufacturer's written instructions for installation. Anchor each product securely in place, accurately located and aligned with other portions of the Work. Clean exposed surfaces and protect from damage.
- C. Clean Project site and work areas daily, including common areas.

3.4 FINAL CLEANING

- A. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion:
  - 1. Remove labels that are not permanent.
  - 2. Clean exposed finishes to a dust-free condition, free of stains, films, and foreign substances. Sweep concrete floors broom clean.
  - 3. Vacuum clean floors in areas of Work..
  - 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures. Clean light fixtures, lamps, globes, and reflectors.
  - 5. Clean Project site, yard, and grounds, in areas disturbed by construction activities. Sweep paved areas; remove stains, spills, and foreign deposits. Rake grounds to a smooth, even-textured surface.

3.5 CLOSEOUT PROCEDURES

- A. Substantial Completion: Before requesting Substantial Completion inspection, complete the following:
  - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
  - 2. Advise Owner of pending insurance changeover requirements.
  - 3. Submit specific warranties, maintenance service agreements, and similar documents.
  - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
  - 5. Submit Record Drawings and Specifications, operation and maintenance manuals, and Similar final record information.
  - 6. Deliver tools, spare parts, extra materials, and similar items.
  - 7. Complete final cleaning requirements.
  - 8. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will proceed with inspection or advise Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will advise Contractor of items that must be completed or corrected before certificate will be issued. C. Request inspection for Final Completion, once the following are complete:
  - 1. Submit a copy of Substantial Completion inspection list stating that each item has been completed or otherwise resolved for acceptance.

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- C. Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
- D. Submit a written request for final inspection for acceptance. On receipt of request, Architect will proceed with inspection or advise Contractor of unfulfilled requirements. Architect will prepare final Certificate for Payment after inspection or will advise Contractor of items that must be completed or corrected before certificate will be issued.

3.6 DEMONSTRATION AND TRAINING

- A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system. Include a detailed review of the following:
  - 1. Include instruction for basis of system design and operational requirements, review of documentation, emergency procedures, operations, adjustments, troubleshooting, maintenance, and repairs.

END OF SECTION 01 70 00

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SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
  - 1. Operation and maintenance documentation directory.
  - 2. Emergency manuals.
  - 3. Operation manuals for systems, subsystems, and equipment.
  - 4. Product maintenance manuals.

1.2 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
  - 1. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
  - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Owner.
    - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
    - b. Enable inserted reviewer comments on draft submittals.
  - 2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Owner will return two copies.
- C. Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Owner will return copy with comments.
  - 1. Correct or revise each manual to comply with Owner's comments. Submit copies of each corrected manual within 15 days of receipt of Owner's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.
- B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
  - 1. Title page.
  - 2. Table of contents.
  - 3. Manual contents.

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- C. Title Page: Include the following information:
1. Subject matter included in manual.
  2. Name and address of Project.
  3. Name and address of Owner.
  4. Date of submittal.
  5. Name and contact information for Contractor.
  6. Name and contact information for Architect.
  7. Names and contact information for major consultants to the Owner that designed the systems contained in the manuals.
  8. Cross-reference to related systems in other operation and maintenance manuals.
- D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
  2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- G. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
    - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
  2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
  3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
  4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
    - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

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2.2 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
1. Type of emergency.
  2. Emergency instructions.
  3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
1. Fire.
  2. Flood.
  3. Gas leak.
  4. Water leak.
  5. Power failure.
  6. Water outage.
  7. System, subsystem, or equipment failure.
  8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
1. Instructions on stopping.
  2. Shutdown instructions for each type of emergency.
  3. Operating instructions for conditions outside normal operating limits.
  4. Required sequences for electric or electronic systems.
  5. Special operating instructions and procedures.

2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
  2. Performance and design criteria if Contractor is delegated design responsibility.
  3. Operating standards.
  4. Operating procedures.
  5. Operating logs.
  6. Wiring diagrams.
  7. Control diagrams.
  8. Piped system diagrams.
  9. Precautions against improper use.
  10. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
  2. Manufacturer's name.
  3. Equipment identification with serial number of each component.
  4. Equipment function.

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5. Operating characteristics.
  6. Limiting conditions.
  7. Performance curves.
  8. Engineering data and tests.
  9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
  2. Equipment or system break-in procedures.
  3. Routine and normal operating instructions.
  4. Regulation and control procedures.
  5. Instructions on stopping.
  6. Normal shutdown instructions.
  7. Seasonal and weekend operating instructions.
  8. Required sequences for electric or electronic systems.
  9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

## 2.4 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
1. Product name and model number.
  2. Manufacturer's name.
  3. Color, pattern, and texture.
  4. Material and chemical composition.
  5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
1. Inspection procedures.
  2. Types of cleaning agents to be used and methods of cleaning.
  3. List of cleaning agents and methods of cleaning detrimental to product.
  4. Schedule for routine cleaning and maintenance.
  5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

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- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

## 2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
  - 1. Standard maintenance instructions and bulletins.
  - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
  - 3. Identification and nomenclature of parts and components.
  - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
  - 1. Test and inspection instructions.
  - 2. Troubleshooting guide.
  - 3. Precautions against improper maintenance.
  - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
  - 5. Aligning, adjusting, and checking instructions.
  - 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- F. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

## PART 3 - EXECUTION

### 3.1 MANUAL PREPARATION

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.



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- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
  - 1. Do not use original project record documents as part of operation and maintenance manuals.

END OF SECTION 017823

## SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
  - 1. Record Drawings.
  - 2. Record Specifications.
  - 3. Record Product Data.
- B. Related Requirements:
  - 1. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

#### 1.2 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
  - 1. Number of Copies: Submit copies of record Drawings as follows:
    - a. Initial Submittal:
      - 1) Submit PDF electronic files of scanned record prints and one set(s) of file prints.
      - 2) Owner will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
    - b. Final Submittal:
      - 1) Submit PDF electronic files of scanned record prints and one set(s) of prints.
      - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy and annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy and annotated PDF electronic files and directories of each submittal.

### PART 2 - PRODUCTS

#### 2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
  - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
    - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    - b. Record data as soon as possible after obtaining it.
    - c. Record and check the markup before enclosing concealed installations.
  - 2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
  - 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.

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4. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Owner. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file with comment function enabled.
  2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
  3. Refer instances of uncertainty to Owner for resolution.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
  2. Format: Annotated PDF electronic file with comment function enabled.
  3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
  4. Identification: As follows:
    - a. Project name.
    - b. Date.
    - c. Designation "PROJECT RECORD DRAWINGS."
    - d. Name of Owner.
    - e. Name of Contractor.

## 2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
  3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
  4. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file.

## 2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
  2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
  3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as annotated PDF electronic file.

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2.4 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Owner's reference during normal working hours.

END OF SECTION 01 78 39

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SECTION 11 61 43 - STAGE CURTAINS AND RIGGING EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
  - 1. Stage curtains, draws, borders, teasers, legs, scrims, and cycloramas
  - 2. Stage curtain tracks, tacks and pipe
  - 3. Rigging equipment

1.2 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.
- C. Samples: (3) samples of each for each exposed product and for each color and texture specified.
- D. Delegated-Design Submittal: For stage-curtain systems and attachments to structure, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans and other details, drawn to scale, and coordinated with each other, using input from installers of the items involved.
- B. Product certificates.
- C. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer of stage curtains.

1.7 WARRANTY

- A. Manufacturer's Special Warranty: Manufacturer agrees to repair or replace components of stage-curtain systems that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period: Two years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 STAGE-CURTAIN SYSTEMS

- A. Description: Complete stage-curtain systems, including stage curtains and tracks; with necessary accessories for support and operation.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Black Sheep Enterprises.
    - b. Chicago Flyhouse
    - c. Georgia Stage, Inc.
    - d. Grand Stage
    - e. iWeiss Theatrical Solutions.
    - f. Janson Industries.
    - g. LimeLight Productions, Inc.
    - h. LuXout Stage Curtains.
    - i. Mainstage Theatrical Supply, Inc.
    - j. NorthEast Stage.
    - k. Rose Brand.
    - l. Sew What? Inc.
    - m. Show Works.
    - n. S&K Theatrical Draperies, Inc.
    - o. Stagecraft Industries, Inc.
    - p. Stage Decoration & Supplies, Inc.

### 2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design stage-curtain systems, including comprehensive engineering analysis and attachments to building structure, using performance requirements.
- B. Structural Performance: Stage-curtain systems and attachments to structure shall withstand the effects of gravity and operational loads.
- C. Fire-Test-Response Characteristics: Provide stage curtains meeting the following requirements as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
1. Flame-Propagation Resistance: Passes NFPA 701.
    - a. Permanently attach label to each fabric of curtain assembly indicating whether fabric is inherently and permanently flame resistant or is treated with flame-retardant chemicals and whether it requires retreatment after cleaning or after a designated time period of use.
    - b. Permanently attach 12-inch- square swatch of same fabric and dye lot for each fabric of a curtain assembly to the back of assembly for use as fire-resistance test strip.

### 2.3 CURTAINS

- A. Fabrics: BASIS OF DESIGN: KM FABRICS
1. Velours: shall be Inherently Flame Resistant (IFR) velour, 54" wide, 25 oz. Charisma velour and IFR velour, 54" wide, 20 oz. Crescent velour.
    - a. Colors: As indicated on drawings.
  2. Sharkstooth Scrim: shall be 100% cotton, flame resistant
    - a. Colors: As indicated on drawings.
  3. Cyclorama: shall be Inherently Flame Resistant (IFR) Polyester Cyclorama.
    - a. Colors: As indicated on drawings.

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- B. Submit certificates showing dye lot and flame testing.

2.4 CURTAIN FABRICATION

A. General:

1. All fabrics shall be constructed with pile running down.
2. All seams shall be vertical with each width running the full height-no horizontal splices.
3. Thread colors shall match face fabric.
4. A label shall be sewn to every curtain showing height, width, and date of flameproofing. Label shall be located on offstage lower hem.

B. Front, Mid, and Rear Draw Curtains:

1. Top hem shall be turned and reinforced with continuous 3 ½" heavy jute webbing. 50 % fullness shall be sewn in with box pleats approximately 12" on center.
2. A heavy grade bag snap hook shall be provided for attachment to carriers at each pleat and ends of curtain.
3. Bottom hem shall be 5 inches and contain a continuous No. 8 jack chain held in a muslin pocket. Secure jack chain to pocket every 36".
4. Side hems shall be a minimum of 12" on the leading edge and 3" on the offstage edge.
5. Snip vertical seams every 36" for proper hanging of seams.

C. Teaser and Border Curtains:

1. Top hem shall be turned and reinforced with continuous 3 ½" heavy jute webbing. 50% fullness shall be sewn in with box pleats approximately 12" on center.
2. A #3 brass grommet shall be inserted every 12" and at ends and contain a 30" dark heavy grade ¾" twill tape for tying curtain to pipe.
3. Bottom hem shall be 5 inches. Side hems shall be a minimum of 3 inches.
4. Snip vertical seams every 36" for proper hanging o seams.

D. Leg Curtains:

1. Top hem shall be turned and reinforced with continuous 3 ½" heavy jute webbing. 50% fullness shall be sewn in with box pleats approximately 12" on center.
2. A #3 brass grommet shall be inserted every 12" and 16" for tie-in fullness, and at ends and contain a 30" dark heavy grade ¾" twill tape for tying curtain to pipe.
3. Bottom hem shall be 5" and contain a continuous No. 8 jack chain held in a muslin pocket, secure jack chain to pocket every 36".
4. Side hems shall be a minimum of 3".
5. Snip vertical seams every 36" for proper hanging of seams.

E. Scrim:

1. Curtain shall be seamless.
2. Top hem shall be turned and reinforced with continuous 3 12" heavy jute or polyester webbing BFM grade; flat construction.
3. Bottom hems shall be 5" with separate muslin pipe pocket.
4. Side hems shall be a minimum of 3".
5. Provide weight pipe as specified.
6. Fabricate and install as directed.

F. Cyclorama:

1. All seams shall be vertical.
2. Top hem shall be double turned and reinforced with a continuous 3 ½" heavy jute webbing BFM grade; flat construction.
3. A heavy grade bag snap hook shall be provided 12" on center and at ends of drop for attachment to carrier or ¾" twill tape for tying to pipe as appropriate.
4. Bottom hem shall be 5" with separate muslin pipe pocket and with webbing with grommets on 12" centers sewn to the back of hem.

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5. Side hems shall be a minimum of 3".
6. Provide weight pipe as specified above.
7. Fabricate and install as directed.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Install stage-curtain system according to curtain and track manufacturer's written instructions.

3.2 CURTAIN INSTALLATION

- A. Track Hung: Secure curtains to track carriers that work with and match existing system.
- B. Batten Hung: Secure curtains to pipe battens that work with and match existing system.
- C. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain stage curtains and tracks.

3.3 CURTAIN SCHEDULE

- A. See drawings I1.1, I1.2 and I1.3 for Curtain Schedules and Rigging Repairs of type, size and quantity per school.

END OF SECTION 11 61 43