APPENDIX III

SECTION 11 61 64 - PERFORMANCE LIGHTING INSTRUMENTS AND ACCESSORIES

PART 1 - GENERAL

* 1. Summary
		1. Work in this section includes manufacture and providing of performance lighting instruments and accessories.
		2. Section Includes:
			1. Materials, components, modifications, assemblies, equipment and services as specified herein. These include, but are not limited to:
				1. Stage lighting instruments.
				2. Stage lighting accessories.
				3. Loose electrical distribution.
	2. Substitutions
		1. No substitutions will be considered.
	3. Unit Pricing
		1. Provide unit pricing for each line item indicated
		2. Include in the unit pricing shipping, and any other incremental costs associated with adding or deleting a unit for the line item.
	4. Adjusted Quantities
		1. Quantities will be adjusted prior to award base on bid pricing.
	5. System description
		1. Design Requirements
			1. Standards and Regulations
				1. Components must comply with applicable regulations.
				2. Provide systems and components that are approved by an accredited independent testing laboratory such as Underwriters Laboratory.
				3. Equipment utilizing Stage Pin Connectors must comply with ANSI E1.24-2006, Entertainment Technology - Dimensional Requirements for Stage Pin Connectors.
				4. Mounting methods must comply with ANSI E1.53-2016, Entertainment Technology - Overhead mounting of luminaires, lighting accessories, and other portable devices: specification and practice

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* + 1. Performance Requirements:
			1. Provide electrical equipment listed and labeled for use as indicated by UL or other independent test agency acceptable to the Code Authority or jurisdiction.
			2. Provide lamps and lighting instruments to operate from 120 volt 60Hz AC, unless otherwise stated.
			3. Lighting Instruments:
				1. Provide each lighting instrument with:

Aluminum C-clamp

Safety cable

(1) one color frame (white light instruments).

(1) One standard length of not less than three (3) feet, 3 conductor cable and grounded stage connector as specified.

* + - * 1. Provide lighting instruments with operating knobs and handles safe to touch for precise operation at all times.
				2. Provide lamped instruments allowing a simple method of lamp replacement without dismantling lighting instrument. No tools are required for lamp replacement.
				3. Provide white light instruments with space for fitting up to two color filters in removable frames in each lighting instrument.
				4. Provide a slot on ellipsoidal spotlights for insertion of an iris or template holder.
				5. Provide focus adjustment of ellipsoidal spotlights from a sharp edge beam to a soft edge beam without stray light rays or extraneous internal reflections from the lens tube.
				6. Securely ground metalwork of lighting instruments.
				7. Ventilate lighting instruments for the maximum designed lamp wattage such that no reduction in rated lamp life or deterioration of the component parts of the lights instruments may be attributed to overheating.
	1. Definitions
		1. The term “furnish” means to supply and deliver to the job site, ready for unloading, unpacking, assembly, installation, and similar operations.
		2. The term “install” is used to describe operations at the job site including the actual anchoring, applying, assembly, cleaning, curing, cutting, erection, finishing, patching, placing, protecting, pulling, terminating, unloading, unpacking, working to dimension, and similar operations that will render the systems complete and ready for the intended use.
		3. The term “provide” means to furnish and install.
		4. Data Communications: Signals that provide control and feedback communications between devices in the system.
		5. Products utilizing the “DMX512” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology

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Association (ESTA), ANSI E1.11 – 2008, Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories.

* + 1. Products utilizing the “ACN” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA) ANSI E1.17 – 2006, Entertainment Technology - Architecture for Control Networks.
		2. Products utilizing the “RDM” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA) ANSI E1.20 – 2006, Entertainment Technology - RDM - Remote Device Management over USITT DMX512 Networks.
		3. Products utilizing “Lightweight/Streaming ACN” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA) ANSI E1.31 – 2009, Entertainment Technology – Lightweight streaming protocol for transport of DMX512 using ACN.
		4. Products utilizing a “0 – 10V” control protocol shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA)ANSI E1.3 - 2001 (R2006), Entertainment Technology - Lighting Control Systems - 0 to 10V Analog Control Specification.
		5. Products utilizing the DMX512 standard Entertainment Services & Technology Association (ESTA), ANSI E1.11 – 2008, Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories shall comply with the rules and recommendations of the following standard: ANSI E1.27-1-2006, Entertainment Technology-Standard for Portable Control Cables for Use with USITT DMX512/1990 and E1.11 (DMX512-A)Products.
		6. Products utilizing the DMX512 standard Entertainment Services & Technology Association (ESTA), ANSI E1.11 – 2008, Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories shall comply with the rules and recommendations of the following standard: ANSI E1.27-2 – 2009, Entertainment Technology - Recommended Practice for Permanently Installed Control Cables for Use with ANSI E1.11 (DMX512-A) and USITT DMX512/1990 Products POE: Power Over Ethernet - an 802.3AF compliant scheme of powering devices on an Ethernet network via the Ethernet cabling.
		7. POE: Power Over Ethernet - an 802.3AF compliant scheme of powering devices on an Ethernet
		8. Individuals, organizations and companies involved in designing, manufacturing and/or using aluminum trusses, towers and associated aluminum structural components such as head blocks, sleeve blocks, bases, and corner blocks in the entertainment industry shall comply with the rules and recommendations of the following standard. ANSI E1.2 - 2006, Entertainment Technology - Design, Manufacture and Use of Aluminum Trusses and Towers.Maintenance
		9. Individuals, organizations and companies involved in the design, manufacture and/or installation of boom and base assemblies, simple ground-support devices for lighting equipment and accessories shall comply with the rules and regulations of the following

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standard. ANSI E1.15 - 2006, Entertainment Technology--Recommended Practices and Guidelines for the Assembly and Use of Theatrical Boom & Base Assemblies.

* + 1. Products utilizing Metal Halide Ballast Power Cables shall comply with the rules and recommendations of the following standard: ANSI E1.16 - 2002 (R2007), Entertainment Technology - Configuration Standard for Metal Halide Ballast Power Cables.
		2. Products utilizing Stage Pin Connectors shall comply with the rules and recommendations of the following standard: ANSI E1.24 – 2006, Entertainment Technology - Dimensional Requirements for Stage Pin Connectors.
		3. Photometric product documentation for stage and studio luminaires used in the live entertainment and performance industries shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA) ANSI E1.9-2007, Entertainment Technology - Reporting Photometric Performance Data for Luminaires Used in Entertainment Lighting.
		4. Lens quality documentation for pattern projecting luminaires intended for entertainment use shall comply with the rules and recommendations of the following standard: Entertainment Services & Technology Association (ESTA) ANSI E1.35 – 2007, Standard for Lens Quality Measurements for Pattern Projecting Luminaires Intended for Entertainment Use
	1. Submittals
		1. Data Sheets & Schedule of equipment
			1. Provide complete data sheets for all components with options and selections highlighted.
			2. Provide a complete detailed list of all components with quantities
		2. Warranty Manual
			1. Clearly state the Warranty of the system and all of its components noting that the individual component is warranted for the longer of the system warranty of the component warranty.
			2. Clearly mark each warranty statement as belonging to Performance Lighting Instruments and Accessories, Section 11 61 64.

PART 2 - PRODUCTS

* 1. Manufacturers
		1. The components (make and model) form the basis of design of the system.
		2. Substitutions
			1. No substitutions will be considered
		3. DMX distribution, testing and analysis equipment
			1. Artistic License

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* + - 1. Martin Professional
			2. Goddard Design
			3. Interactive Technologies
			4. Fleenor Designs
			5. Pathway
		1. Data Cable:
			1. Lex Products, Stamford, CT
			2. ProPlex
		2. Extension Cable Assemblies:
			1. Altman Stage Lighting Co., Yonkers, NY
			2. SSRC, Greer, SC
			3. James Thomas Engineering LTD, Knoxville, TN
			4. Lex Products, Stamford, CT
		3. Instrument Accessories and Rigging Accessories:
			1. Altman Stage Lighting Co
			2. The Light Source
			3. City Theatrical
	1. Equipment
		1. General:
			1. Supply all Pipe Hung devices other than cable with:
				1. 30” Safety Cable:

0.125" 7x19 Wire rope with compression sleeve eye

on both ends and one (1) Snap Hook (McMaster-Carr 3716T31).

* + - * 1. Clamp: Apollo Get-A-Grip or equal.
				2. Black Finish
			1. Supply All pipe mounted powered devices
				1. Power connector 1. 20A

a. Two (2) pin and ground stage connector.

* + 1. Cyc Lighting Instruments:

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* + - 1. Supply with Floor Trunnions and Hanging Arm with clamp.
	1. Cable
		1. General
			1. Portable Cable Labeling
				1. Provide unshrunk clear shrink wrap on all cables. Owner will provide their own labeling and shrink when complete.
		2. LED Fixture Jumper Cable
			1. All connectors are Neutrik Powercon connectors of appropriate ampacity.
			2. Jumper Cable - 20amp

Provide 20 amp cables with 3 core, No. 12, type SO, with 20 amp stage male connector at one end and matching female connector at the other end. Lengths as specified.

* + 1. Stage Jumper Cable:
			1. Jumper Cable - 20amp

Provide 20 amp cables with 3 core, No. 12, type SO, with 20 amp stage male connector at one end and matching female connector at the other end. Lengths as specified.

* + 1. 3 Phase Feeder Cable Sets:
			1. Cam-Lok J Series Connectors One end male, one end female
			2. Type SC Cable
			3. Connector Colors
				1. Hot – Red, Blue, Black
				2. Neutral – White
				3. Ground - Green
		2. DMX-512 extension cables.
			1. Provide cables with Neutrik connectors.
			2. Terminate both pair of conductors and shield at connectors.
			3. Employ Proplex cable.
		3. Ethernet Category 5e extension cables.
			1. Provide cables with Neutrik Ethercon connectors.
			2. Terminate all 4 pair of conductors at connectors.
			3. Employ Proplex cable.

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* 1. Supplementary
		1. Furnish equipment and hardware in addition to the items specified previously that are necessary to provide a fully working system in conformance with the intent of the Contract Documents.

PART 3 - EXECUTION

* 1. Installation
		1. (none)
	2. Equipment and Component Schedules
		1. See Attached Equipment and Component Schedule.

# END OF SECTION

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| Item # |  |  | Manufacturer | Model | Description | Unit | Theatre | **Total** | Unit Cost Add / Deduct |
|  | **Lighting Instruments:** |  |  |  |  |  |
|  |  | **Ellipsoidal** |  |  |  |  |  |  |
| 1 |  |  | ETC | Color SourceLED CSSPOTS | Instrument Body: RGBL with ShutterBarrel | Each | 100 | **100** |  |
| 2 |  |  | ETC | 419ELT | Enhanced Definition Lens Tube forSource Four Ellipsoidal 19 degree | Each | 25 | **25** |  |
| 3 |  |  | ETC | 426ELT | Enhanced Definition Lens Tube forSource Four Ellipsoidal 26 degree | Each | 30 | **30** |  |
| 4 |  |  | ETC | 436ELT | Enhanced Definition Lens Tube forSource Four Ellipsoidal 36 degree | Each | 40 | **40** |  |
| 5 |  |  | ETC | LED50LT | Enhanced Definition Lens Tube forSource Four Ellipsoidal 50 degree | Each | 25 | **25** |  |
|  |  | **Wash** |  |  |  |  |  |  |
| 6 |  |  | ETC | Color SourcePAR | RGBL Color LED, w/ safety cable,yoke and Clamp | Each | 30 | **30** |  |
|  |  | **StripLight / Cyc Lighting** |  |  |  |  |  |
| 7 |  |  | Chroma-Q | ColorForce II 72 (CHCF272RGBA) | RGBA Color LED Striplight | Each | 6 | **6** |  |
| 8 |  |  | Chroma-Q | CHC FCL72 | Cyc Lens for ColorForce 72 | Each | 6 | **6** |  |
| 9 |  |  | Chroma-Q | CHCFBL72 | Border lens for ColorForce 72 | Each | 6 | **6** |  |
|  |  | **Automated** |  |  |  |  |  |  |
| 10 |  |  | High End | SolaFrame Theatre | LED Automated Theatre Fixture withmounting hardware and Power connector | Each | 6 | **6** |  |

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| Item # |  |  | Manufacturer | Model | Description | Unit | Theatre | **Total** | Unit Cost Add / Deduct |
| 11 |  |  | High End | SolaSpot 1000 | LED Automated Theatre Fixture withmounting hardware and Power connector | Each | 12 | **12** |  |
| 12 |  |  | High End |  | Replacement Gobos for SolaSpot -Rotating Gobos determined by Owner during Submittal | Each | 30 | **30** |  |
| 13 |  |  | Martin | Mac Aura | LED Automated Fixture with mountinghardware and power connector | Each | 18 | **18** |  |
| 14 |  |  | Martin |  | Snoot for Mac Aura | Each | 18 | **18** |  |
|  | **Dimmers** |  |  |  |  |  |  |
| 15 |  |  | ETC | 2XSL1210B-T | ETC Touring Dimmer System with Stage Pin and Cam-Lok Power Input, and 100A Main Breaker. Cam-Lokreverse gender for Neutral / Ground. | Each | 1 | **1** |  |
| 16 |  |  |  |  | Cam Lok 5 Conductor Feeder Cable -25' | Each | 1 | **1** |  |

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| Item # |  |  | Manufacturer | Model | Description | Unit | Theatre | **Total** | Unit Cost Add / Deduct |
|  | **Accessories:** |  |  |  |  |  |  |
|  |  | **Elipsoidal Instrument Accessories** |  |  |  |  |
| 17 |  |  | City Theatrical | Stacker Series | Tapered 6 1/4" Short Full Top hats forSource Four Ellipsoidal 19-50 degree equipment - 2842 | Each | 100 | **100** |  |
| 18 |  |  | ETC |  | Color Frame for Source Four 19-50degree Ellipsoidal | Each | 100 | **100** |  |
| 19 |  |  | ETC | 400PH-A | Template holders A-Size for SourceFour Ellipsoidal | Each | 100 | **100** |  |
|  |  | **Wash Instrument Accessories** |  |  |  |  |  |
| 20 |  |  | ETC | 400BD | Barndoors for Wash LED | Each | 30 | **30** |  |
| 21 |  |  | ETC | SELRW | Color Source Par Lens: Wide - Round | Each | 30 | **30** |  |
|  | **Lighting Console and Accessories** |  |  |  |  |  |
|  |  | **Lighting Console** |  |  |  |  |  |
| 22 |  |  | ETC | Gio-24k | ETC Gio Console, 24,576 Outputs | Each | 1 | **1** |  |
| 23 |  |  | ETC | Eos RPU3-24K | Eos Remote Processor Unit, 24,576Outputs | Each | 1 | **1** |  |
|  |  | **Console Accessories** |  |  |  |  |  |
| 24 |  |  | Generic |  | Main Console Hook Up Cable set 25' | Each | 1 | **1** |  |
| 25 |  |  | Generic |  | Monitor - 21" Flatpanel Touchscreen | Each | 2 | **2** |  |
| 26 |  |  | Generic |  | Monitor - 21" Flatpanel for RPU | Each | 2 | **2** |  |
| 27 |  |  | ETC | Gio-FC | Gio Console Flight Case | Each | 1 | **1** |  |
|  |  | **Lighting Network** |  |  |  |  |  |
| 28 |  |  | ETC | N3T2G-2F | Ethernet Gateway - Portable with 2 @DMX Output and C-Clamp Hardware | Each | 8 | **8** |  |
|  | **Cable:** |  |  |  |  |  |  |
|  |  | **Adapters** |  |  |  |  |  |  |
| 29 |  |  |  |  | PowerCon to 2PG | Each | Per Spec | **AR** |  |

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| Item # |  |  | Manufacturer | Model | Description | Unit | Theatre | **Total** | Unit Cost Add / Deduct |
|  |  | **Jumper Powercon, 120V, 20A** |  |  |  |  |  |
| 30 |  |  | Lex | Powerflex | Jumper cable - 10' | Each | 120 | **120** |  |
| 31 |  |  | Lex | Powerflex | Jumper cable - 15' | Each | 80 | **80** |  |
| 32 |  |  | Lex | Powerflex | Jumper cable - 25' | Each | 25 | **25** |  |
| 33 |  |  | Lex | Powerflex | Jumper cable - 50' | Each | 15 | **15** |  |
|  |  | **Data Communications Cable - DMX** |  |  |  |  |
| 34 |  |  | Lex | DMX-5P-5 | DMX-512 cable 5' | Each | 50 | **50** |  |
| 35 |  |  | Lex | DMX-5P-10 | DMX-512 cable 10' | Each | 100 | **100** |  |
| 36 |  |  | Lex | DMX-5P-15 | DMX-512 cable 15' | Each | 100 | **100** |  |
| 37 |  |  | Lex | DMX-5P-25 | DMX-512 cable 25' | Each | 50 | **50** |  |
| 38 |  |  | Lex | DMX-5P-50 | DMX-512 cable 50' | Each | 25 | **25** |  |
| 39 |  |  | Lex | DMX-5P-100 | DMX-512 cable 100' | Each | 25 | **25** |  |
|  |  | **Data Communications Cable - Ethernet** |  |  |  |  |
| 40 |  |  |  |  | Ethernet cable 10' | Each | 10 | **10** |  |
| 41 |  |  |  |  | Ethernet cable 25' | Each | 10 | **10** |  |
| 42 |  |  |  |  | Ethernet cable 100' | Each | 10 | **10** |  |

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| Item # |  |  | Manufacturer | Model | Description | Unit | Theatre | **Total** | Unit Cost Add / Deduct |
|  | **DMX Signal Devices** |  |  |  |  |  |  |
|  |  | **DMX Distribution** |  |  |  |  |  |  |
| 43 |  |  | Lex | DMX5P-TERM | DMX Terminator | Each | 30 | **30** |  |
|  | **Supplemental:** |  |  |  |  |  |  |
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