

APPENDIX A

Shakespeare on the Saskatchewan Lighting Package

Products

1.1 PRODUCT LIST

.1 Pole Type 1A (x7)

- .1 (x2) Luminaire AA – “For Pathway Color” – Acclaim Dyna Drum EO QS
- .2 (x1) Luminaire BB – “Motion Sensor White for Pathway Lighting” – Lithonia Radean Arm Mount with nLight Air

.2 Pole Type 1B (x6)

- .1 (x3) Luminaire CC - “For Color Wash Trees” – Acclaim Dyna Drum SO QS

.3 Pole Type 1C (x1)

- .1 (x1) Luminaire DD – “Dynamic Color Change Sponsor Gobo” – Martin Exterior 500 Image Projector
- .2 (x2) Luminaire AA – “For Pathway Color” – Acclaim Dyna Drum EO QS
- .3 (x1) Luminaire EE – “Tent Color with Static Gobo” – Martin Exterior 500 Image Projector

.4 Pole Type 1D (x1)

- .1 (x1) Luminaire DD – “Dynamic Color Change Sponsor Gobo” – Martin Exterior 500 Image Projector
- .2 (x2) Luminaire AA – “For Pathway Color” – Acclaim Dyna Drum EO QS
- .3 (x1) Luminaire BB – “Motion Sensor White for Pathway Lighting” – Lithonia Radean Arm Mount with nLight Air
- .4 (x1) Luminaire EE – “Tent Color with Static Gobo” – Martin Exterior 500 Image Projector

.5 Pole Type 1E (x1)

- .1 (x2) Luminaire AA – “For Pathway Color” – Acclaim Dyna Drum EO QS
- .2 (x2) Luminaire FF – “For Static Gobo” on Trees – Martin Exterior 500 Image Projector

.6 Pole Type 1F (x1)

- .1 (x2) Luminaire AA – “For Pathway Color” – Acclaim Dyna Drum EO QS
- .2 (x1) Luminaire BB – “Motion Sensor White for Pathway Lighting” – Lithonia Radean Arm Mount with nLight Air
- .3 (x1) Luminaire EE – “Tent Color with Static Gobo” – Martin Exterior 500 Image Projector

.7 Pole Type 1G (x2)

- .1 (x2) Luminaire GG – “Ground Color” – Acclaim Dyna Drum SO QS

.8 Fixture Type 2

- .1 (56 sections, ~640ft) Type 2 – “Exterior Vandal Resistant LED Tape – RGBW” – Acclaim Spectrum Exterior

.9 Fixture Type 3

- .1 (1 Section, ~87ft) Type 3 – “Linear Wall Grazing LED” for curved terrace wall near riverbank – Acclaim FlexTube SC

.10 Type 4

- .1 (x48) Rebelle 2400 7L steplights with 0-10V dimming and controlled via DMX.

1.3 CONTROLS

.1 Controls Components

.1 ETC Mosaic – Show Control

- .1 Mosaic(MSC2) has the ability to play out lighting scenes and timeline based shows over DMX using astronomical, real time or external inputs. This controller has been used around the world in many high profile exterior lighting applications as well as museums, art installations and theme parks.
- .2 Mosaic allows for triggering and show-control integration using Ethernet, RS232/485, DMX, MIDI, digital/analog inputs and optional remote devices. This means that Shakespeare will be able to override the time based lighting schedules during a show and send commands to the controller via their lighting board.
- .3 Mosaic's Designer Software works on a Mac or PC and the user-friendly interface streamlines the process of designing and contain powerful tools for ongoing management. Software and configuration upload using Ethernet. If the controller is connected to the internet, an integrated web server provides status, configuration information, active monitoring and remote triggering using Ethernet. For mobile phone or tablet control, an app is available for the ETC theatrical lighting board which would allow Shakespeare to trigger shows remotely during show season when their lighting board is connected to the lighting system.
- .4 ETC provides 24/7/365 phone support to all customers for any and all issues including simple instructions for turning the system on or off.

.2 Acclaim Aria – Wireless DMX

- .1 Aria is a compact outdoor rated wireless DMX system. Aria transceivers enable transmission of DMX signals up to 2600 feet line of sight between units. All units are housed in powder coated die-cast aluminum enclosures with IP66 outdoor ratings, and are supplied with a 5dB omnidirectional antennae. Each Aria transceiver can act as both a transmitter or receiver, depending on which is fed with a cabled DMX input. Fifteen radio channels are available to choose from, allowing the user to avoid interference sources such as Wi-Fi access points. All Aria wireless signals are AES 128 bit encrypted.
- .2 Aria can also make a direct connection (without the need for an additional unit) to compatible fixtures such as Acclaim Dyna Drum SO (Colored Lights for Trees & Courtyard) and Dyna Drum EO (Ground Color Lights).
- .3 Shakespeare site will be able to transmit to only

one universe of DMX at this time. There is room within the existing universe should Shakespeare decide to add to the system. For example, this would be desirable if adding more luminaires of similar purpose, or additional luminaires to the existing poles. If they decided they would like to add more lighting controlled on a separate universe of DMX, Aria can have up to 8 separate universes transmitting simultaneously so adding a universe is as simple as adding another transmitter.

- .4 As with any wireless technology, obstructions can limit the range. To account for this, we have 3 additional units of Aria Transmission/Signal Boost. These will increase the signal strength at present

.3 nLight Air – Pathway Lighting

- .1 nLight Air is a sensor-based digital lighting controls solution that offers wireless controls which can easily connect luminaires, sensors and other control devices to create a digital network. The white pathway lights we are proposing will have an nLight Air sensor built right into them. The sensors are able to communicate with each other wirelessly, and are commissioned via Bluetooth connection to a mobile app. Five layers of security prevent any unauthorized access to the controls. We are able to set the operation of the sensors (e.g.: dim the lights to 10% during unoccupied state, return to full when occupied), and group them together via the app. Under normal circumstances, no other equipment would be required. However, to allow Shakespeare to override the normal operation of the lights during a show, we will provide an nLight Air Eclipse gateway in the storage space, along with an exterior antennae. The Eclipse is able to accept contact closure commands from the Mosaic show controller and broadcast them wirelessly to the nLight Air sensors.

.2 Controls Methodology

- .1 The Mosaic Controller forms the “brain” of the site control, housing all scheduled lighting events as well as accepting input from theatrical show control. Mosaic Designer Software allows Shakespeare to design shows remotely. The controller can also be accessed remotely if connected to ethernet. When an ETC theatrical lighting board is employed on site, Shakespeare is also be able to access the lighting control via mobile app.
- .2 Aria Wireless will be used to broadcast DMX signals received from Mosaic to all pole mounted colored lights, thus eliminating the need to run DMX cabling to all fixtures. Aria enabled fixtures from Acclaim lighting reduces the number of transceivers required.
- .3 nLight Air sensors and wireless control are integrated in to the white pathway lights, allowing for simple motion sensor & photocell control. By providing the nLight Air Eclipse gateway, the pathway lights are able to accept commands

from a contact closure within the Mosaic Controller, allowing Shakespeare to override the normal operation of the pathway lights during a show.

1.4 LIGHTING DESIGN COMPONENTS

.1 Type AA – Pathway Color Light

- .1 Acclaim Dyna Drum EO QS – DDV-2X1-ACLN
- .2 The Dyna Drum EO has a built-in wireless Aria DMX receiver, to allow every location to receive DMX wirelessly without the need to pull DMX wire underground. These fixtures can then pass DMX out to other non-Aria-enabled luminaires on the poles, eliminating the need to provide additional receivers around the site.
- .3 The Drum EO has an OLED menu that will feel familiar to any theatrical lighting technician. The menu allows “at-fixture” address changes and basic diagnostics without special tools. Password protection eliminates the risk of unauthorized changes.
- .4 The lens options are field changeable, should future tree growth render this a necessity.
- .5 The QS version has been chosen for its warmer white. QS has Red, Green, Blue, and 3000 Kelvin White pre-mixed within the fixture resulting in richer looking color and preventing the “Lite Brite look” when viewing the fixture face.
- .6 With an aperture of only 145mm/5.71” and weighing under 12lbs, this fixture will be unobtrusive on the lighting poles.

.2 Type BB – White Motion Sensor Light

- .1 Lithonia Radean - RAD1 LED P1 35K PATH 120 SPA NLTAIR2
- .2 Radean is a new exterior family from Lithonia Lighting which has been designed specifically, for pedestrian areas. The diffuse, regressed lens provides comfortable light with low glare and achieves a “night-sky” friendly rating with its full cut-off reflector. Pathway specific optics place the light exactly where it is needed and achieves a 25 lux average on the walking path using the lowest power level at just 25 watts of consumption, mounted at 15’ above ground.
- .3 During normal operation, an integral occupancy sensor located behind the lens of the fixture will keep the lights dimmed to 10% until it senses any approaching pedestrians, at which point the fixture will brighten to 100%. Fixtures can be grouped together so that if any sensor in the group is triggered, all will respond. Grouping and changes to the dim levels is easily done on site via free cell phone app.

.3 Type CC – Color Wash Trees

- .1 Acclaim Dyna Drum SO QS – DDF-2X1-ACLN
- .2 The Dyna Drum SO is the big brother to the (Type AA) Dyna Drum EO QS and has approximately double the lumen output of the EO. This is important to the application as the tree wash lights have potential to throw light further, aren’t aimed at human eye level, and will be illuminating a dark/irregular surface

(leaves).

- .3 The aperture size increases to 232mm/9.13” however, since these would be mounted higher and further away from the audience courtyard and walking path. As such we feel this size is suitably unobtrusive.
- .4 Like Drum EO, Drum SO has a built-in wireless Aria DMX receiver, Quad Color Source with 3000 Kelvin white, and operation and adjustments that are familiar to theatrical technicians.

.4 Type DD – Dynamic Sponsor Logos

- .1 Martin Exterior 500 Image Projector
- .2 Martin manufactures industry leading moving lights for TV, Live Music, and Broadway. They are a familiar presence in any lighting rental package. The Exterior 500 is basically an LED moving light without the motorized pan & tilt, and as such the parts inside are common, supported, extensively field tested, and familiar to most lighting technicians.
- .3 The Martin Ext500 has several ways to make sponsor logos dynamic and eye catching.
- .4 The Ext500 features 6 gobo slots, allowing the festival to acknowledge multiple sponsors over the course of the evening. Perhaps the Festival sponsor is Nutrien, so, their logo is showing before every show, but the opening night reception after the show is sponsored by SaskTel - both of these logos can stay loaded in the Ext500 and the programming in the control system can swap them at any time.
- .5 The Ext500 also features a full set of 8 dichroic color chips. This allows Shakespeare on the Saskatchewan the option of Black & White Glass gobos, which are approximately 1/3 the price of a full color gobo, but still having a sponsor logo appears on the ground in color. For an even more eye-catching sponsor logo projection, the light can be programmed to do a “color roll” continually changing slowly from one color slide to the next.
- .6 All gobos in the Ext500 are loaded onto rotating holders, which allow the technician to easily program looks onto the ground with a specific orientation, or slowly rotating. It would, for example, be desirable to orient the sponsor logos the correct reading direction for people walking into the space before the show, but to have them slowly rotate during intermission so the people mingling about can read them from any vantage point.
- .7 The source in this image projector is a 230w LED producing 6100lm at 8300K. While this color temperature is very cold, it is what lighting technicians are used to seeing out of Arc-source moving lights, and it will assist in the images “popping” against the color from the other lighting. Should the color be deemed too cool for a sponsor’s logo, it can be programmed with the on-board CTO color dichroic behind it to warm it up.
- .9 The first Full-Color-Original gobo per Type DD is included with this package.

.5 Type EE – Static Tent Gobo with Color

- .1 Martin Exterior 500 Image Projector
- .2 The 6 gobos that come with the Ext500 are excellent breakup gobos to add

texture to an uneven surface (i.e.: tent structure). Even with the long (50'-60') throw distance this device will provide plenty of output.

- .3 The built-in color wheel can be programmed to slowly rotate through color, or to stop halfway between 2 color-slides to produce what is called a split color.
- .4 If the split color and rotating prism feature are combined, suddenly 3 lights look like 9, and the look achieved is very textured - providing larger, fuller coverage.

.6 Type FF – Static Gobo on Trees at Entrance

- .1 Martin Exterior 500 Image Projector
- .2 While the Exterior 500 has many features (prism, color change, rotation) which are not necessarily required for this specific application, we did not find any more streamlined luminaires on the market that we felt met the minimum quality and output that should be expected here.
- .3 Projecting images, especially text, on an irregular surface such as trees presents a challenge in readability. The best ways to overcome these are crisp focus, bright source, single color (white!) light, and blocky/chunky images. The Exterior 500 can certainly offer crisp focus, bright source, and white light.
- .4 Included is a Custom Black & White Glass Original gobo with each Type FF, so that the Festival may have a different image on either side of the entrance.
- .5 There is also a tremendous benefit to having consistency across luminaires, especially when gobos are involved. Every luminaire selected has the potential to require a different size of gobo than any other luminaire. By having the front gate gobo lights the same device as the sponsor gobo lights inside the festival space, Shakespeare could move a gobo from the courtyard out to be an entrance image.

.7 Type 2 – Amphitheatre Riser Lights

- .1 Acclaim Flex Spectrum Exterior (RGBW)
- .2 56 sections totaling nearly 480' of 24v tape, in FLX777 Recessed Channel w/ Opal Lens
- .3 Driven on ALD-800-24 power supply/interfaces.
- .4 Acclaim Flex Spectrum is a specification grade tape that is fully IP68 rated. It has excellent lumen output with a 3000 Kelvin white chip. A high lumen output will be essential for visibility during the off-season.
- .5 installation of this includes ganging together two shorter adjacent sections as one to reduce the number of home runs of 5-wire by 18. These combinations are all lateral on the same riser to continue to allow for per-riser control of the lights.
- .6 There are factory leads for every section of Flex Spectrum to help minimize time and labor on site. There will be several off-cuts of 1m to 2m in length, they may have been given to the lighting department at Shakespeare on the Saskatchewan to incorporate as set lighting for their shows.
- .7 It should be noted that regardless of product chosen, the distance and number of

24V home runs back to the DMX-PWM Interface (interface and drivers must be mounted in a heated room) will pose challenges. Rough take-offs suggest that home run lengths could exceed 27m/90', which has the electrical contractor pulling 14/5 to the furthest pieces of Type 2 product.

- .9 We have chosen the FLX777 4' recessed channel to house the tape, as it is more difficult for vandals to pull the lensing out of than most channels. The lensing is flat, and slides in from the end of channel, if the very edge is still considered too tempting to a determined vandal, a decorative cap could be fabricated to cover the visible end of the lens. The lensing is very economical both cost and storage space wise, so having a few spares on hand is easy, though ultimately not as necessary as it would be for others.
- .10 The ALD-800-24 is Acclaim's large-scale low voltage power supply, it allows for individual DMX control of up to 10 outputs of RGBW.

.8 Type 3 – Curved Terrace Wall by Riverbank

- .1 Acclaim Flex Tube SC 3000K
- .2 Flex Tube has a sideways curve, and a pleasing soft diffusion. This will be a comfortable low-output accent (110lm/ft) to the curved terrace wall/railing. Three pieces (7m ea.) are in this location, with one requiring a field cut & end cap to fit the exact size run distance of the wall curve.

.9 Type 4 – Amphitheatre Stairs Egress Lighting

- .1 Rebelle 2700 3000K step lights
- .2 To have 0-10V dimming control with DMX compatibility.
- .3 For separate control than type 2 to allow for egress during Shakespeare events and shows.