SP-150405
(New)

SPECIAL PROVISIONS
FOR
AESTHETIC LIGHTING, MATERIAL ONLY

Scott County
IMN-074-1(235)5--0E-82

Effective Date
July 17, 2018

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

150405.01 DESCRIPTION.

A. This item shall consist of furnishing, storing until delivery, and transporting to storage or to a site designated by the Engineer an aesthetic lighting luminaire, as described below, including power supply/driver, branch circuit/extension, mounting hardware, fusing, and surge protection. Aesthetic luminaires shall be delivered complete and ready for installation. The work includes but is not limited to storing of the materials until ready for shipment, unloading of the shipment, stacking, protecting against damage, all submittals, and all appurtenances and hardware required for a complete operating unit. Included in this item is the coordination with each contractor awarded a segment of the bridge and/or roadway construction project.

B. General.

1. Related Documents.
Drawings and general provisions of the Contract and applicable portions of Section 2523 of the Standard Specifications.

2. Work Under Separate Contract.
Luminaire installation shall be conducted by the Contractor(s) awarded segment(s) of the individual bridge and/or roadway construction project.

3. Definitions.
- **a.** Supplier: Supplier of the aesthetic luminaire complete with lamp, mounting hardware, and all other components necessary to have a complete, fully operational unit.
- **b.** Contract: Supply Contract specified herein.
- **c.** Contractor: The General Contractor(s) awarded a highway construction contract(s).

150405.02 MATERIALS.

A. Provide lighting materials that meet the requirements of Division 41, except as modified here.

1. Aesthetic Luminaire, Type "LA". The luminaire shall be: Lumenpulse; LBX RO-240-RGB-NS-NS-NS-CC-DMX/RDM-SY-3GV-CRC-UL-10FT-LBXWG-CC, Lumenbeam Xlarge (LBX) RGB, with the NS (narrow spot – 10 degrees) lighting distribution type.

a. Information Required. The supplier shall submit the following information relative to the luminaire he proposes to furnish:

1) Outline drawing.
2) Complete description and weight.
3) Candlepower distribution curve.
4) Luminaire efficacy.
5) Center beam candle power.
6) Manufacturer's name and catalogue designation of the luminaire.
7) IES formatted photometric curve in electronic format.

b. Manufacturer to provide pre-installation site visit to confirm installation and programming plan with contractor, lighting control system integrator and engineer present.

c. Sample. One completely assembled luminaire with cord and plug of the manufacturer's intended luminaire to be furnished, shall be submitted upon request of the Engineer within 15 business days of such request. The sample shall also include a means to demonstrate the luminaire's color changing ability.

d. Assembly. Each luminaire shall be delivered completely assembled, wired and ready for installation. It shall consist of: low copper content cast aluminum housing with dual chambered design for heat management, silicone sealing devices, stainless steel hardware, tempered glass lens cover, wire guard for glass lens, 108 (36 red, 36 green, 36 blue) LEDs with 10 degree optics, 10 foot power and DMX cable, short yoke hanging bracket with lockable adjustment knob and all necessary hardware, IP66 rated, 3G vibration rated.

e. Finish. The luminaire shall have a corrosion resistant powder coated finish for marine environments. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval by the Engineer. Custom color to match mounting surface (satin grey-blue; Federal Standard No.595 color code 26099). Submit paint chip for approval of custom color.

f. Control. Fixture shall be controlled via DMX from lighting control system.

g. Connections. Power and data cable entry shall be rated IP66 with a polycarbonate cable gland.

h. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The submittal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	4046 lms
Minimum Efficacy	28 lms/W
Minimum Center Candle Power	109,194 cd
Beam Spread	10 degrees

i. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If test results are available of the same luminaire (including LED model) being provided, they may be considered as meeting the testing requirements of this Special Provision. The Engineer

will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.

1) Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:
- A polar candela distribution table.
- A flood summary table.
- An LM- 79 report
- An LM- 80 report

2) Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:
- Regulation data.
- Power factor.
- A table of power supply characteristics.

3) Initial testing (start of life testing)
- Any automatic thermal management features.
- Power supply losses (system efficiency)
- Current waveform shape and inrush current.
- Record voltage waveform.
- Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.
- Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

j. Fixture must be RoHS compliant and have passed RoHS testing.

k. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.

l. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.

m. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of project acceptance. This will be interpreted particularly to mean compatible performance of power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the City of Bettendorf shall be within 6 months of documentation.

n. RGB LED Array.

1) Light Output. RGB color mixing should provide a full spectrum of lighting colors. Calculated at 120,000 hours the mean output lumens shall not be less than 70% of the initial lumen output.

2) Testing. All LEDs shall be tested according to the applicable requirements in LM80 and shall operate between a minimum ambient temperature of -13°F and a maximum ambient temperature of 122°F.

3) LED Array Characteristics. RGB LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
142	120,000	4046

2. Aesthetic Luminaire, Type "LA-1". The luminaire shall be: Lumenpulse; LBX RO-240-RGB-VN-VN-VN-CC-DMX/RDM-SY-3GV-CRC-UL-10FT-LBXWG-CC, Lumenbeam Xlarge (LBX) RGB, with the VN (very narrow spot – 6 degrees) lighting distribution type.

a. Information Required. The Supplier shall submit the following information relative to the luminaire he proposes to furnish:
  1) Outline drawing.
  2) Complete description and weight.
  3) Candlepower distribution curve.
  4) Luminaire efficacy.
  5) Center beam candle power.
  6) Manufacturer's name and catalogue designation of the luminaire.
  7) IES formatted photometric curve in electronic format.

b. Manufacturer to provide pre-installation site visit to confirm installation and programming plan with contractor, lighting control system integrator and engineer present.

c. Sample. One completely assembled luminaire with cord and plug of the manufacturer's intended luminaire to be furnished, shall be submitted upon request of the Engineer within 15 business days of such request. The sample shall also include a means to demonstrate the luminaire's color changing ability.

d. Assembly. Each luminaire shall be delivered completely assembled, wired and ready for installation. It shall consist of: low copper content cast aluminum housing with dual chambered design for heat management, silicone sealing devices, stainless steel hardware, tempered glass lens cover, wire guard for glass lens, 108 (36 red, 36 green, 36 blue) LEDs with 6 degree optics, 10 foot power and DMX cable, short yoke hanging bracket with lockable adjustment knob and all necessary hardware, IP66 rated, 3G vibration rated.

e. Finish. The luminaire shall have a corrosion resistant powder coated finish for marine environments. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval by the Engineer. Custom color to match mounting surface (satin grey-blue; Federal Standard No.595 color code 26099). Submit paint chip for approval of custom color.

f. Control. Fixture shall be controlled via DMX from lighting control system.

g. Connections. Power and data cable entry shall be rated IP66 with a polycarbonate cable gland.

h. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The submittal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	4745 lms
Minimum Efficacy	34 lms/W
Minimum Center Candle Power	181,689 cd
Beam Spread	6 degrees

i. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If test results are available of the same luminaire (including LED model) being provided, they may be considered as meeting the testing requirements of this Special Provision. The Engineer will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.
  1) Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:
    - A polar candela distribution table.
    - A flood summary table.
    - An LM- 79 report

- An LM- 80 report

2) Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:
- Regulation data.
- Power factor.
- A table of power supply characteristics.

3) Initial testing (start of life testing)
- Any automatic thermal management features.
- Power supply losses (system efficiency)
- Current waveform shape and inrush current.
- Record voltage waveform.
- Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.
- Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

j. Fixture must be RoHS compliant and have passed RoHS testing.

k. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.

l. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.

m. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of project acceptance. This will be interpreted particularly to mean compatible performance of coatings, power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the City of Bettendorf shall be within 6 months of documentation.

n. RGB LED Array (LA-1).

1) Light Output. RGB color mixing should provide a full spectrum of lighting colors. Calculated at 120,000 hours the mean output lumens shall not be less than 70% of the initial lumen output.

2) Testing. All LEDs shall be tested according to the applicable requirements in LM80 and shall operate between a minimum ambient temperature of -13°F and a maximum ambient temperature of 122°F.

3) LED Array Characteristics. RGB LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
138	120,000	4745

3. Aesthetic Luminaire, Type "LA-2". The luminaire shall be: Lumenpulse; LBX RO-240-RGB-NF-NF-NF-CC-DMX/RDM-SY-3GV-CRC-UL-10FT-LBXWG-CC, Lumenbeam Xlarge (LBX) RGB, with the NF (narrow flood - 20 degrees) lighting distribution type.

a. Information Required. The Supplier shall submit the following information relative to the luminaire he proposes to furnish:

1) Outline drawing.

2) Complete description and weight.

3) Candlepower distribution curve.

4) Luminaire efficacy.

5) Center beam candle power.

6) Manufacturer's name and catalogue designation of the luminaire.
7) IES formatted photometric curve in electronic format.

b. Manufacturer to provide pre-installation site visit to confirm installation and programming plan with contractor, lighting control system integrator and engineer present.

c. Sample. One completely assembled luminaire with cord and plug of the manufacturer's intended luminaire to be furnished, shall be submitted upon request of the Engineer within 15 business days of such request. The sample shall also include a means to demonstrate the luminaire's color changing ability.

d. Assembly. Each luminaire shall be delivered completely assembled, wired and ready for installation. It shall consist of: low copper content cast aluminum housing with dual chambered design for heat management, silicone sealing devices, stainless steel hardware, tempered glass lens cover, wire guard for glass lens, 108 (36 red, 36 green, 36 blue) LEDs with 20 degree optics, 10 foot power and DMX cable, short yoke hanging bracket with lockable adjustment knob and all necessary hardware, IP66 rated, 3G vibration rated.

e. Finish. The luminaire shall have a corrosion resistant powder coated finish for marine environments. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval by the Engineer. Custom color to match mounting surface (satin grey-blue; Federal Standard No.595 color code 26099). Submit paint chip for approval of custom color.

f. Control. Fixture shall be controlled via DMX from lighting control system.

g. Connections. Power and data cable entry shall be rated IP66 with a polycarbonate cable gland.

h. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The submittal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	4536 lms
Minimum Efficacy	32 lms/W
Minimum Center Candle Power	26,048 cd
Beam Spread	20 degrees

i. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If test results are available of the same luminaire (including LED model) being provided, they may be considered as meeting the testing requirements of this Special Provision. The Engineer will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.

1) Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:
- A polar candela distribution table.
- A flood summary table.
- An LM- 79 report
- An LM- 80 report

2) Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:
- Regulation data.
- Power factor.
- A table of power supply characteristics.

3) Initial testing (start of life testing)

- Any automatic thermal management features.
- Power supply losses (system efficiency)
- Current waveform shape and inrush current.
- Record voltage waveform.
- Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.
- Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

j. Fixture must be RoHS compliant and have passed RoHS testing.

k. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.

l. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.

m. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of project acceptance. This will be interpreted particularly to mean compatible performance of power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the City of Bettendorf shall be within 6 months of documentation.

n. RGB LED Array (LA-2).

1) Light Output. RGB color mixing should provide a full spectrum of lighting colors. Calculated at 120,000 hours the mean output lumens shall not be less than 70% of the initial lumen output.

2) Testing. All LEDs shall be tested according to the applicable requirements in LM80 and shall operate between a minimum ambient temperature of -13°F and a maximum ambient temperature of 122°F.

3) LED Array Characteristics. RGB LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
140	120,000	4536

4. Aesthetic Luminaire, Type "LB". The luminaire shall be: Lumenpulse; LBL-240-RGB-NF-NF-NF-CC-3GV-CRC-UL-10FT-LBLWG-CC, Lumenbeam Large (LBL) RGB, with the NF (narrow flood – 20 degrees) lighting distribution type.

a. Information Required. The Supplier shall submit the following information relative to the luminaire he proposes to furnish:

1) Outline drawing.

2) Complete description and weight.

3) Candlepower distribution curve.

4) Luminaire efficacy.

5) Center beam candle power.

6) Manufacturer's name and catalogue designation of the luminaire.

7) IES formatted photometric curve in electronic format.

b. Manufacturer to provide pre-installation site visit to confirm installation and programming plan with contractor, lighting control system integrator and engineer present.

c. Sample. One completely assembled luminaire with cord and plug of the manufacturer's intended luminaire to be furnished, shall be submitted upon request of the Engineer

within 15 business days of such request. The sample shall also include a means to demonstrate the luminaire's color changing ability.

d. Assembly. Each luminaire shall be delivered completely assembled, wired and ready for installation. It shall consist of: low copper content cast aluminum housing with dual chambered design for heat management, silicone sealing devices, stainless steel hardware, tempered glass lens cover, wire guard for glass lens, 36 (12 red, 12 green, 12 blue) LEDs with 20 degree optics, 10 foot power and DMX cable, standard yoke hanging bracket with lockable adjustment knob and all necessary hardware, IP66 rated, 3G vibration rated.

e. Finish. The luminaire shall have a corrosion resistant powder coated finish for marine environments. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval by the Engineer. Custom color to match mounting surface (satin grey-blue; Federal Standard No.595 color code 26099). Submit paint chip for approval of custom color.

f. Control. Fixture shall be controlled via DMX from lighting control system.

g. Connections. Power and data cable entry shall be rated IP66 with a polycarbonate cable gland.

h. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The submittal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	1512 lms
Minimum Efficacy	28 lms/W
Minimum Center Candle Power	8683 cd
Beam Spread	20 degrees

i. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If test results are available of the same luminaire (including LED model) being provided, they may be considered as meeting the testing requirements of this Special Provision. The Engineer will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.

1) Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:
- A polar candela distribution table.
- A flood summary table.
- An LM- 79 report
- An LM- 80 report

2) Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:
- Regulation data.
- Power factor.
- A table of power supply characteristics.

3) Initial testing (start of life testing)
- Any automatic thermal management features.
- Power supply losses (system efficiency)
- Current waveform shape and inrush current.
- Record voltage waveform.
- Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.

- Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

j. Fixture must be RoHS compliant and have passed RoHS testing.

k. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.

l. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.

m. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of project acceptance. This will be interpreted particularly to mean compatible performance of power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the City of Bettendorf shall be within 6 months of documentation.

n. RGB LED Array (LB).

1) Light Output. RGB color mixing should provide a full spectrum of lighting colors. Calculated at 120,000 hours the mean output lumens shall not be less than 70% of the initial lumen output.

2) Testing. All LEDs shall be tested according to the applicable requirements in LM80 and shall operate between a minimum ambient temperature of -13°F and a maximum ambient temperature of 122°F.

3) LED Array Characteristics. RGB LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
50	120,000	1512

5. Aesthetic Lighting Data Hub. The data and power integration hub (for types LA, LA-1, LA-2 and LB) shall be Lumenpulse CBX-ST-240-DMX/RDM-CC-CRC SPL FLANGES WITH BOLT HOLES. The Data and Power Integration Hub boosts the DMX data signal and allows a star configuration with up to 6 data outputs. It requires a specified voltage between 120V-277V power input. The box is required between the DMX wire from the DMX wireless receiver and the fixture. A special mounting flange will be developed by the manufacturer. The manufacturer shall create a shop drawing of the flange to be approved by engineer.

a. Assembly.

1) IP66-rated enclosure.

2) Die-cast aluminum with low copper content enclosure.

3) Special mounting flange to be provided by manufacturer.

b. Finish.

1) Electro-statically applied polyester powder coat finish.

2) Corrosion-resistant coating for marine environments.

3) Custom color to match mounting surface. Submit paint chip for approval of custom color.

c. Connections.

1) Data input, 1/2'' provision holes for 1/2" NPT, PG16 or 20mm

2) Power input, 1/2'' provision holes for 1/2" NPT, PG16 or 20mm

3) Up to six outputs, 1/2'' provision holes for 1/2" NPT, PG16 or 20mm

4) Operating temperatures: -25°C to 50°C [-13F to 122F]

d. Electrical.

1) 240v input.

e. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the

test, all set screws, castings and components shall be secure and undamaged. The data hub will not be energized for this test.

f. Warranty. The manufacturer shall warrant the performance and construction of these power data integration hubs to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of project acceptance. Any power data integration hub or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the City of Bettendorf shall be within 6 months of documentation.

6. Aesthetic Luminaire Type "LC". The luminaire shall be: Lumenpulse; LBL-240-__K-FL-CC-NO-3GV-CRC-UL-10FT, Lumenbeam Large (LBL), with the FL (Flood – 40 degrees) lighting distribution type + LBLVS-CC-BK, Visor Accessory. LED Correlated Color Temperature (CCT) to be determined by the owner based upon results from mock up demonstration employing materials and finishes to be installed on site.

Approved Alternates:

- Color Kinetics (Reach Compact with Half Glare Shield): 523-000084-CCT 120-000068-14, 120-000187-01, Custom Corrosion Resistant Coating
- GVA Lighting (FL100): FL100-CUSTOM-__K-40-AC-SM,121567, Custom Corrosion Resistant Coating

a. Information Required. The Supplier shall submit the following information relative to the luminaire he proposes to furnish Outline drawing.

1) Complete description and weight.
2) Candlepower distribution curve.
3) Luminaire efficacy.
4) Center beam candle power.
5) Manufacturer's name and catalogue designation of the luminaire.
6) IES formatted photometric curve in electronic format.

b. Sample. To determine LED CCT, manufacturer shall provide pre-installation Mock-up for review and approval by the Engineer. The mock-up shall simulate specified lighting system conditions as shown on the plans. For each substitution item which is not specified on the plans provide mock- up installation at no cost to the Department if requested, and as directed by the Engineer. Following the mock-up, one completely assembled luminaire with cord and plug of the manufacturer's intended luminaire to be furnished, shall be submitted upon request of the Engineer within 15 business days of such request.

c. Assembly. Each luminaire shall be delivered completely assembled, wired, and ready for installation. It shall consist of: low copper content cast aluminum housing with dual chambered design for heat management, silicone sealing devices, stainless steel hardware, tempered glass lens cover, 36 LEDs with 40 degree optics, 10 foot power and DMX cable, hanging bracket with lockable adjustments, accessory Visor (LBL-VS-CC-BK) and all necessary hardware. IP66 rated, 3G vibration rated.

d. Finish. The luminaire shall have a corrosion resistant powder coated finish for marine environments. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval by the Engineer. Color shall match concrete. Paint chips shall be submitted for approval by the Engineer, Architect and Lighting Designer.

e. Connections. Power and data cable entry shall be rated IP66 with a polycarbonate cable gland.

f. Control. Fixture shall be controlled via timeclock.

g. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The proposal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	2104 lms
Minimum Efficacy	42 lms/W
Minimum Center Candle Power	7215 cd
Beam Spread	40 degrees

h. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If test results are available of the same luminaire (including LED model) being provided, they may be considered as meeting the testing requirements of this Special Provision. The Engineer will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.

1) Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:

- A polar candela distribution table.
- A flood summary table.
- An LM-79 report
- An LM-80 report

2) Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:

- Regulation data.
- Power factor.
- A table of power supply characteristics.

3) Initial testing (start of life testing)

- Any automatic thermal management features.
- Power supply losses (system efficiency)
- Current waveform shape and inrush current.
- Record voltage waveform.
- Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.
- Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

i. Fixture must be RoHS compliant and have passed RoHS testing.

j. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.

k. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.

l. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of project acceptance. This will be interpreted particularly to mean compatible performance of power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects

within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the City of Bettendorf shall be within 6 months of documentation.

m. White LED Array (LC).

1) Light Output. White light with a correlated color temperature (CCT) to be determined. Calculated at 120,000 hours the mean output lumens shall not be less than 70% of the initial lumen output.

2) Testing. All LEDs shall be tested according to the applicable requirements in LM80 and shall operate between a minimum ambient temperature of -13°F and a maximum ambient temperature of 122°F.

3) LED Array Characteristics. LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
50	120,000	2104

7. Aesthetic Luminaire Type "LD". The luminaire shall be: Lumenpulse; LBL-240-__K-NF-CC-NO-3GV-CRC-UL-10FT, Lumenbeam Large (LBL), with the NF (Narrow Flood – 20 degrees) lighting distribution type + LBLVS-CC-BK, Visor Accessory. LED Correlated Color Temperature (CCT) to match type LC and to be determined by the owner based upon results from mock up demonstration employing materials and finishes to be installed on site.

Approved Alternates:

- Color Kinetics (Reach Compact with Half Glare Shield): 523-000084-CCT 120-000068-13, 120-000187-01, Custom Corrosion Resistant Coating
- GVA Lighting (FL100): FL100-CUSTOM-__K-20-AC-SM,121567, Custom Corrosion Resistant Coating

a. Information Required. The Supplier shall submit the following information relative to the luminaire he proposes to furnish:

1) Outline drawing.

2) Complete description and weight.

3) Candlepower distribution curve.

4) Luminaire efficacy.

5) Center beam candle power.

6) Manufacturer's name and catalogue designation of the luminaire.

7) IES formatted photometric curve in electronic format.

b. To determine LED CCT, manufacturer shall provide pre-installation Mock-up for review and approval by the Engineer. The mock-up shall simulate specified lighting system conditions as shown on the Contract Drawings. For each substitution item which is not specified on the Contract Drawings provide mock- up installation at no cost to the Department if requested, and as directed by the Engineer.

c. Sample. One completely assembled luminaire with cord and plug of the manufacturer's intended luminaire to be furnished, shall be submitted upon request of the Engineer within 15 business days of such request.

d. Assembly. Each luminaire shall be delivered completely assembled, wired, and ready for installation. It shall consist of: low copper content cast aluminum housing with dual chambered design for heat management, silicone sealing devices, stainless steel hardware, tempered glass lens cover, 36 LEDs with 20 degree optics, 10 foot power and DMX cable, hanging bracket with lockable adjustments, accessory Visor (LBL-VS-CC-BK) and all necessary hardware. IP66 rated.

e. Finish. The luminaire shall have a corrosion resistant powder coated finish for marine environments. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval

by the Engineer. Color shall match concrete. Paint chips shall be submitted for approval by the Engineer.

f. Connections. Power and data cable entry shall be rated IP66 with a polycarbonate cable gland.

g. Control. Fixture shall be controlled via timeclock.

h. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The proposal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	2071 lms
Minimum Efficacy	41 lms/W
Minimum Center Candle Power	4212 cd
Beam Spread	20°

i. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If test results are available of the same luminaire (including LED model) being provided, they may be considered as meeting the testing requirements of this Special Provision. The Engineer will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.

1) Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:

- A polar candela distribution table.
- A flood summary table.
- An LM-79 report
- An LM-80 report

2) Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:

- Regulation data.
- Power factor.
- A table of power supply characteristics.

3) Initial testing (start of life testing)

- Any automatic thermal management features.
- Power supply losses (system efficiency)
- Current waveform shape and inrush current.
- Record voltage waveform.
- Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.

j. Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

k. Fixture must be RoHS compliant and have passed RoHS testing.

l. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.

m. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.

g. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or

material developing within a period of 5 years after the date of project acceptance. This will be interpreted particularly to mean compatible performance of power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the City of Bettendorf shall be within 6 months of documentation.

n. White LED Array (LD).

1) Light Output. White light with correlated color temperature (CCT) to be determined. Calculated at 120,000 hours the mean output lumens shall not be less than 70% of the initial lumen output.

2) Testing. All LEDs shall be tested according to the applicable requirements in LM80 and shall operate between a minimum ambient temperature of -13°F and a maximum ambient temperature of 122°F.

3) LED Array Characteristics. LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
50	120,000	2071

8. Pier Luminaire Type “LE”. The luminaire shall be: Lumenpulse; LOG RO-240-36-__K-30x60-WAM2-CC-NO + LOGLC leader cables (Length 10 feet), Lumenfacade, 3 foot length. LED Correlated Color Temperature (CCT) to match type LC and to be determined by the owner based upon results from mock up demonstration employing materials and finishes to be installed on site.

Approved Alternates:

- Color Kinetics (eW Graze QLX Powercore with Leader Cables and Mounting Arm): 523-000081-CCT, 108-000056-3, 120-000201-FINISH
- GVA Lighting (STR9 Monochromatic with Leader Cables and Mounting Arm): STR9-900-CM-7.5W-__K-30x60-INF, 121130,140725)

a. Information Required. The Supplier shall submit the following information relative to the luminaire he proposes to furnish:

1) Outline drawing.

2) Complete description and weight.

3) Candlepower distribution curve.

4) Luminaire efficacy.

5) Manufacturer’s name and catalogue designation of the luminaire.

6) IES formatted photometric curve in electronic format.

b. To determine LED CCT, manufacturer shall provide pre-installation Mock-up for review and approval by the Engineer. The mock-up shall simulate specified lighting system conditions as shown on the Contract Drawings. For each substitution item which is not specified on the Contract Drawings provide mock- up installation at no cost to the Department if requested, and as directed by the Engineer.

c. Sample. One completely assembled luminaire with cord and plug of the manufacturer intended to be furnished, shall be submitted upon request of the Engineer within 15 business days of such request.

d. Assembly. Each luminaire shall be delivered completely assembled, wired and ready for installation. It shall consist of extruded, anodized, low copper content aluminum housing rated IP66, a hinged mounting plate, clear polycarbonate lens, 25.5W LED array with 30 degree by 60 degree optics, terminals for power in, locking hinge mounting bracket, integral power supply, gaskets and all necessary hardware. Order cables to connect fixtures to J-box.

e. Finish. The luminaire shall have a corrosion resistant powder coated finish for marine environments. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval by the Engineer. Color shall match concrete. Paint chips shall be submitted for approval by the Engineer.

f. Connections. All power cables will be UL rated. Order Leader cables and other jumper cables as needed to connect the LE fixtures to their J-boxes.

g. Control. Fixture shall be controlled via timeclock.

h. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The proposal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	1350 lms Minimum
Efficacy	53 lms/W
Beam Spread	30degrees by 60 degrees

i. Power Supply. The power supply must be integral to the fixture. It must be designed to furnish proper electrical characteristics for starting and operating a 46 watt, white LED array at maximum ambient temperatures of 122°F. The power supply will be capable of meeting the voltage requirements specified by the engineer.

1) LED Array Operation. The power supply must operate the white LED array at an input voltage specified by engineer.

2) Power Factor. The power factor of the power supply over the design range of input voltages specified above must not be less than 0.95.

3) LED Array Wattage. The power supply must deliver 46 watts at 120V to a white LED array when operating at the nominal input voltage. Wattage must not vary by more than ±5%.

4) The power supply input current must have Total Harmonic Distortion (THD) of less than 5% when operated at nominal line voltage.

5) The power supply must be thermally protected to drop the power to the LED array if necessary to maintain a safe operating temperature.

6) The power supply must be UL certified.

j. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If test results are available of the same luminaire (including LED model) being provided, they may be considered as meeting the testing requirements of this Special Provision. The Engineer will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.

1) Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:

- A polar candela distribution table.
- A flood summary table.
- An LM-79 report
- An LM-80 report

2) Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:

- Regulation data.
- Power factor.
- A table of power supply characteristics.

3) Initial testing (start of life testing)
- Any automatic thermal management features.
- Current waveform shape and inrush current.
- Record voltage waveform.
- Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.
- Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

k. Fixture must be RoHS compliant and have passed RoHS testing.

l. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.

m. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.

n. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of project acceptance. This will be interpreted particularly to mean compatible performance of power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the respective City of Bettendorf or Moline shall be within 6 months of documentation.

o. White LED Array (LE).

1) Light Output. White light with correlated color temperature (CCT) to be determined, with all LEDs falling within a 4-step MacAdam ellipse. Calculated at 120,000 hours and at a mean temperature of 25°C, the mean lumen output shall not be less than 70% of the initial lumen output.

2) Testing. All LEDs shall be tested according to the applicable requirements in LM79-08 and LM80-08 and shall operate between a minimum ambient temperature of -13°F and a maximum ambient temperature of 122°F.

3) LED Array Characteristics. White LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
46	120,000	1350

9. Aesthetic Luminaire Type "LH". The luminaire shall be: Lumenpulse Lumenbeam Medium; LBM-240-40K-NS-LSLH-CC-NO-3GV-CRC-UL-3 (linear spread lens horizontal). White LED Correlated Color Temperature 4000K (CCT).

Approved Alternates:
- Color Kinetics (Reach Compact with Spread Lens): 523-000084-CCT 120-000068-16, 120-000187-01, Custom Corrosion Resistant Coating
- GVA Lighting (FL100): FL100-CUSTOM-4000K-10x40-AC-SM,121567, Custom Corrosion Resistant Coating

a. Information Required. The Supplier shall submit the following information relative to the luminaire he proposes to furnish:

1) Outline drawing.

2) Complete description and weight.

3) Candlepower distribution curve.

4) Luminaire efficacy.

5) Center beam candle power.
6) Manufacturer's name and catalogue designation of the luminaire.
7) IES formatted photometric curve in electronic format.

b. Sample. One completely assembled luminaire with cord and plug of the manufacturer intended to be furnished, shall be submitted upon request of the Engineer within 15 business days of such request

c. Assembly. Each luminaire shall be delivered completely assembled, wired, and ready for installation. It shall consist of: low copper content cast aluminum housing with dual chambered design for heat management, silicone sealing devices, stainless steel hardware, tempered glass lens cover, 18 LEDs with narrow spot optics, LSLH (linear spread lens horizontal), 3 foot power cable, hanging bracket with lockable adjustments, and all necessary hardware. IP66 rated, 3G vibration rated.

d. Finish. The luminaire shall have a corrosion resistant powder coated finish for marine environments. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval by the Engineer. Custom color to match mounting surface (satin grey-blue; Federal Standard No.595 color code 26099). Paint chips shall be submitted for approval by the Engineer.

e. Connections. Power and data cable entry shall be rated IP66 with a polycarbonate cable gland.

f. Control. Fixture shall be controlled via timeclock.

g. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The proposal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	1049 lms
Minimum Efficacy	36 lms/W
Minimum Center Candle Power	8019 cd
Beam Spread	10 degrees

h. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If test results are available of the same luminaire (including LED model) being provided, they may be considered as meeting the testing requirements of this Special Provision. The Engineer will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.

1) Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:
- A polar candela distribution table.
- A flood summary table.
- An LM-79 report
- An LM-80 report

2) Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:
- Regulation data.
- Power factor.
- A table of power supply characteristics.

3) Initial testing (start of life testing)
- Any automatic thermal management features.
- Power supply losses (system efficiency)

- Current waveform shape and inrush current.
- Record voltage waveform.
- Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.
- Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

i. Fixture must be RoHS compliant and have passed RoHS testing.

j. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.

k. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.

l. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of project acceptance. This will be interpreted particularly to mean compatible performance of power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the City of Bettendorf shall be within 6 months of documentation.

m. LED Array (LH).

1) Light Output. White light with a correlated color temperature 4000K (CCT). Calculated at 120,000 hours the mean output lumens shall not be less than 70% of the initial lumen output.

2) Testing. All LEDs shall be tested according to the applicable requirements in LM80 and shall operate between a minimum ambient temperature of -13°F and a maximum ambient temperature of 122°F.

3) LED Array Characteristics. LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
28	120,000	1049

10. Aesthetic Luminaire Type "LJ". The luminaire shall be: General Electric Tetra Contour GEWWXNLE1-40K-A + GEPS24W-80 (power supply), flexible, linear LED 4000K Correlated Color Temperature (CCT).

Approved Alternates:

- iLight Technologies (Plexineon White 2X Series): T-24-X45-S-CL-CC-00, 65-ADV100W24V (power supply)
- LED Linear (VarioLED Flex Venus): VariorLED Flex VENUS-W830-LENGTH-TV-IP67, MEAN WELL HLG-100H-24A (power supply)

a. Information Required. The Supplier shall submit the following information relative to the luminaire he proposes to furnish:

1) Outline drawing.

2) Complete description and weight.

3) Candlepower distribution curve.

4) Luminaire efficacy.

5) Center beam candle power.

6) Manufacturer's name and catalogue designation of the luminaire.

7) IES formatted photometric curve in electronic format.

b. Sample. One completely assembled luminaire with cord and plug of the manufacturer intended to be furnished, shall be submitted upon request of the Engineer within 15 business days of such request.

c. Assembly. Each luminaire shall be delivered completely assembled, wired, and ready for installation. It shall consist of: flexible polymer light engine, GEWWXNLE1-40K-A; Lexan mounting clips, GEXNMCAC, and all necessary hardware. IP66 rated.

d. Finish. The luminaire shall be comprised of non-corrosive materials. The luminaire finish shall have passed salt spray testing to ASTM B117 standards. Surface texture and paint quality shall be subject to inspection and approval by the Engineer. Light guide shall be diffused white. Samples shall be submitted for approval by the Engineer, Architect and Lighting Designer.

e. Connections. Power cable and fixture connections shall be made inside weather proof junction box or using approved weatherproof connectors per manufacturer's installation instructions.

f. Control. Fixture shall be controlled via timeclock.

g. Power Supply. The power supply shall be General Electric Tetra LED Power Supply Model Number GEPS24W-80, or approved alternate. It must be designed to furnish proper electrical characteristics for starting and operating a 23 watt, white LED array between a minimum ambient temperature of -40°C and a maximum ambient temperature of 60°C. The power supply will be capable of accepting input voltage between 90 and 264 VAC and providing a maximum of 80W at 25.6 VDC. The power supply must be UL certified.

h. Photometric Requirements. The manufacturer shall demonstrate that the luminaire meets or exceeds the specified photometric requirements. The manufacturer shall provide published photometric luminaire data as part of the submitted package. The proposal shall contain luminaire photometric performance with results equal to or better than those listed as minimum requirements identified below in this Special Provision. Submittal information shall include a summary demonstrating achievement of all listed performance requirements.

Minimum Performance Requirements:

Minimum Delivered Lumens at Full Output	131lms/ft
Minimum Efficacy	45lms/W
Beam Spread	123 degrees H by 180 degrees V

i. Testing. All testing shall be done on a prototype of the actual luminaire to be provided under this Special Provision by an independent testing company. If test results are available of the same luminaire (including LED model) being provided, they may be considered as meeting the testing requirements of this Special Provision. The Engineer will have the final approval of which tests are adequate. The manufacturer shall be responsible for all costs associated with the specified testing, incidental to this contract.

1) Photometric testing shall be in accordance with published IESNA lighting measurement testing and calculation guidelines. The tests, at a minimum, shall yield:
- A polar candela distribution table.
- A flood summary table.
- An LM-79 report
- An LM-80 report

2) Electrical testing shall conform to applicable NEMA and ANSI standards and at a minimum shall yield:
- Regulation data.
- Power factor.
- A table of power supply characteristics.

3) Initial testing (start of life testing)
- Any automatic thermal management features.
- Power supply losses (system efficiency)

- Current waveform shape and inrush current.
- Record voltage waveform.
- Photometry data for the test fixture shall be recorded and compared to data for the same fixture provided by the manufacturer.
- Results for voltage and current waveforms for ignition voltage, crest factors, power factor.

j. Fixture must be RoHS compliant and have passed RoHS testing.

k. Thermal testing in accordance with UL. At no time shall any of the components exceed the manufacturer's recommended operating temperatures.

l. Vibration testing in accordance with ANSI Standard C136.31. Upon completion of the test, all set screws, castings and components shall be secure and undamaged. The luminaire will not be energized for this test.

m. Warranty. The manufacturer shall warrant the performance and construction of these luminaires to meet the requirements of this special provision and shall warrant all parts, components and appurtenances against defects due to design, workmanship or material developing within a period of 5 years after the date of project acceptance. This will be interpreted particularly to mean compatible performance of power supply, failure of any component, discolorations or fogging of lenses impairing the transmission of light. Any luminaire or part thereof, not performing as required or developing defects within this period shall be replaced by the manufacturer without expense to the State. The maximum turnaround time for a replacement of defective material delivered to the City of Bettendorf shall be within 6 months of documentation.

n. White LED Array (LJ).

1) Light Output. White light with a 4000K Correlated Color Temperature (CCT). Calculated at 50,000 hours the mean output lumens shall not be less than 70% of the initial lumen output.

2) Testing. All LEDs shall be tested according to the applicable requirements in LM80 and shall operate between a minimum ambient temperature of -13°F and a maximum ambient temperature of 122°F.

3) LED Array Characteristics. LED array shall meet the following:

Maximum Wattage	Rated Life (hours)	Initial Lumens
2.88 / ft	50,000	131 /ft

150405.03 Fabrication.

A. Material shall be fabricated in a timeframe to meet the dates given in the following table. The Supplier shall then store the luminaires in a safe and secure manner, protected from damage, until the time in which the materials are requested for shipment to each construction project (see Section D.4 for assignment of Site numbers to bridge and roadway construction projects deliveries).

Site Number	Fabrication Date
02	April 1, 2019
03	April 1, 2020

B. Once the luminaires are fabricated and secured in storage, the Supplier shall provide photo documentation to the Engineer that the luminaires are completed. This photo documentation shall include a photo of each shipping label with the construction contract identification number and group number, type of luminaire, and number of luminaires within the Contractor's requested set ready for shipment.

150405.04 Shipment.

The Special Provision for the individual Contracts that will install the supplied materials as described in SP-150354 requires the Contractor to coordinate with the Supplier to establish delivery schedules for luminaires within 6 weeks of the individual contract award as tabulated in the schedule below. The Contractor will submit the proposed delivery schedule to the Engineer for approval. Based on the approved delivery schedule, the Supplier will deliver the luminaires to a storage facility at a site designated by the Engineer (within 10 miles of the contract limits), or as noted below, at the date given. If the Supplier fails to deliver the luminaires at the approved date, he shall be penalized at the same per day rate as missing the intermediate completion date for fabrication per Site number. Penalty shall be equivalent to the listed liquidated damages listed in the proposal. Appurtenant items required for proper storage shall be included in this item.

A. Delivery should be coordinated to minimize handling and on-site storage requirements. If required, storage at the project site shall be provided by the general contractor(s). The supplier shall transport, unload the shipment, stack, and protect at the storage site or marshalling area. The locations for delivery are:

State	Contract Number	Delivery Location
Illinois	64C08	To Be Provided
Iowa	IM-NHS-074-1(197)5--03-82	To Be Provided
Iowa	IM-NHS-074-1(198)5--03-82	To Be Provided
Iowa	IM-NHS-074-1(199)5--03-82	6225 North Brady Street, Davenport, IA 52806
Iowa	IM-NHS-074-1(200)5--03-82	To Be Provided

i. The luminaires, power supplies and mounting hardware shall be packaged during shipment to protect all surfaces from being scratched, marred, chipped, or damaged in any way. Any minor damage to the luminaire metallic surfaces shall be touched-up in a professional manner as approved by the paint manufacturer with protective coating solutions as provided by the Supplier of the luminaire at no additional cost to the Department. Any major damage to the luminaire, including damage to the lens, shall be repaired at the Supplier's place of business or it shall be replaced. The Engineer will be the sole judge of the extent of any such damage and the adequacy of repair.

B. Luminaire information submitted for approval shall include any recommendations of the supplier for storage as provided under this contract.

C. Luminaire device information submitted for approval shall include any recommendations of the supplier for the installation of the luminaire as provided under this contract.

D. The packaging of the luminaire shall incorporate the provisions recommended by the supplier to accommodate storage.

E. If delivered luminaires are to be stored outdoors, care shall be taken to insure packaging does not deteriorate due to weather and exposure to the elements.

F. A minimum of 24 luminaires per delivery is required, or the complete shipment if the contract has less than 24 luminaires. In the case that more than 24 luminaires are to be delivered to a contract, the general contractor(s) may elect for multiple shipments to be made. The supplier shall schedule his operations so as to furnish the luminaires in accordance with the following schedule:

Aesthetic Luminaire "LA" Delivery Schedule					
State	**Contract Number**	**Estimated Delivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Iowa	IM-NHS-074-1(198)5--03-82 (westbound materials)	April 1, 2019	November 26, 2019	56	02
Iowa	IM-NHS-074-1(198)5--03-82 (eastbound materials)	July 1, 2019	November 25, 2020	56	02

Aesthetic Luminaire "LA-1" Delivery Schedule					
State	**Contract Number**	**EstimatedDelivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Iowa	IM-NHS-074-1(198)5--03-82 (westbound materials)	April 1, 2019	November 26, 2019	28	02
Iowa	IM-NHS-074-1(198)5--03-82 (eastbound materials)	July 1, 2019	November 25, 2020	28	02

Aesthetic Luminaire "LA-2" Delivery Schedule					
State	**Contract Number**	**Estimated Delivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Iowa	IM-NHS-074-1(198)5--03-82 (westbound materials)	April 1, 2019	November 26, 2019	24	02
Iowa	IM-NHS-074-1(198)5--03-82 (eastbound materials)	July 1, 2019	November 25, 2020	24	02

Aesthetic Luminaire "LB" Delivery Schedule					
State	**Contract Number**	**Estimated Delivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Iowa	IM-NHS-074-1(198)5--03-82 (westbound materials)	April 1, 2019	November 26, 2019	24	02
Iowa	IM-NHS-074-1(198)5--03-82 (eastbound materials)	July 1, 2019	November 25, 2020	24	02

Aesthetic Luminaire "LC" Delivery Schedule					
State	**Contract Number**	**Estimated Delivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Iowa	IM-NHS-074-1(197)5--03-82 (westbound materials)	April 1, 2019	November 26, 2019	57	02
Iowa	IM-NHS-074-1(197)5--03-82 (eastbound materials)	July 1, 2019	November 25, 2020	57	02
Iowa	IM-NHS-074-1(199)5--03-82	April 1, 2019	November 26, 2019	8	02
Iowa	IM-NHS-074-1(200)5--03-82	April 1, 2020	November 25, 2020	8	03

Aesthetic Luminaire "LD" Delivery Schedule					
State	**Contract Number**	**Estimated Delivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Iowa	IM-NHS-074-1(197)5--03-82 (westbound materials)	April 1, 2019	November 26, 2019	153	02
Iowa	IM-NHS-074-1(197)5--03-82 (eastbound materials)	July 1, 2019	November 25, 2020	153	02
Iowa	IM-NHS-074-1(199)5--03-82	April 1, 2019	November 26, 2019	28	02
Iowa	IM-NHS-074-1(200)5--03-82	April 1, 2020	November 25, 2020	28	03

Aesthetic Luminaire "LE" Delivery Schedule					
State	**Contract Number**	**Estimated Delivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Illinois	64C08	October 1, 2019	November 25, 2020	71	02
Iowa	IM-NHS-074-1(199)5--03-82	April 1, 2019	November 26, 2019	46	02
Iowa	IM-NHS-074-1(200)5--03-82	April 1, 2020	November 25, 2020	47	03

Aesthetic Luminaire "LH" Delivery Schedule					
State	**Contract Number**	**Estimated Delivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Iowa	IM-NHS-074-1(198)5--03-82 (eastbound materials)	July 1, 2019	November 25, 2020	4	02

Aesthetic Luminaire "LJ" Delivery Schedule					
State	**Contract Number**	**Estimated Delivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Iowa	IM-NHS-074-1(198)5--03-82 (eastbound materials)	July 1, 2019	November 25, 2020	4	02

Aesthetic Lighting Data Hub Delivery Schedule					
State	**Contract Number**	**Estimated Delivery Time Frame**		**Total Contract Quantity**	**Site Number**
		No Earlier Than	**No Later Than**		
Iowa	IM-NHS-074-1(198)5--03-82 (westbound materials)	April 1, 2019	November 26, 2019	6	02
Iowa	IM-NHS-074-1(198)5--03-82 (eastbound materials)	July 1, 2019	November 25, 2020	6	02

150405.05 METHOD OF MEASUREMENT.
This work shall be measured by count.

150405.06 BASIS OF PAYMENT.
This work shall be paid for at the contract unit price each for Aesthetic Light, Type "LA" (Material Only); Aesthetic Light, Type "LA-1" (Material Only); Aesthetic Light, Type "LA-2" (Material Only); Aesthetic Light, Type "LB" (Material Only); Aesthetic Light, Type "LC" (Material Only); Aesthetic Light, Type "LD" (Material Only); Aesthetic Light, Type "LE" (Material Only); Aesthetic Light, Type "LH" (Material Only); Aesthetic Light, Type "LJ" (Material Only); and Aesthetic Lighting Data Hub (Material Only), which shall be full payment for

furnishing, storing until delivery, delivering, stacking, protecting against damage, and unloading to a location as designated herein an aesthetic luminaire complete as described in these specifications.