

**AGREEMENT BETWEEN  
SAN DIEGO UNIFIED PORT DISTRICT  
and  
SOUTHERN CONTRACTING COMPANY  
for  
CORONADO BRIDGE LIGHTING MOCK-UP TEST  
AGREEMENT NO. 10-2020MA**

The parties to this Agreement are the SAN DIEGO UNIFIED PORT DISTRICT, a public corporation (District) and SOUTHERN CONTRACTING COMPANY, a California Corporation (Service Provider). The parties agree to the following:

1. **SCOPE OF SERVICES.** Service Provider shall furnish all technical and professional labor, and materials to satisfactorily comply with Attachment A, Scope of Services, attached hereto and incorporated herein, as requested by District. Service Provider shall keep the Executive Director of the District or their designated representative informed of the progress of said services at all times.
2. **TERM OF AGREEMENT.** This Agreement shall commence on February 12, 2020 and shall terminate on December 31, 2020, subject to earlier termination as provided below.
3. **COMPENSATION.** For performance of services rendered pursuant to this Agreement and as further described in Attachment B, Compensation and Invoicing, attached hereto and incorporated herein; District shall compensate Service Provider based on the following, subject to the limitation of the maximum expenditure provided herein:
  - a. **Maximum Expenditure.** The maximum expenditure under this Agreement shall not exceed \$744,692.00. Said expenditure shall include without limitation all sums, charges, reimbursements, costs and expenses provided for herein. Service Provider shall not be required to perform further services after compensation has been expended. In the event that the Service Provider anticipates the need for services in excess of the maximum Agreement amount, the District shall be notified in writing

immediately. District must approve an amendment to this Agreement before additional fees and costs are incurred.

- b. **Payment Procedure.** For work performed on an hourly basis, Service Provider agrees to assign the person with the lowest hourly rate who is fully competent to provide the services required. If Service Provider finds it necessary to have work, which would usually be performed by personnel with a lower rate, performed by personnel paid at the higher hourly rate, Service Provider shall nevertheless, bill at the lower rate.
- c. **Progress Documentation.** Service Provider shall provide District progress reports in a format and on a schedule as District directs. Progress reports shall include a description of work completed, cumulative dollar costs incurred, anticipated work for the next reporting period, percentage of work complete, and the expected completion date for remaining work. The report shall identify problem areas and important issues that may affect project cost and/or schedule. The report shall present actual percent completion versus planned percent completion.
- d. **Additional Services; Task Authorizations**
  - (1) Additional services may be required for the completion of the services specified in this Agreement. For performance of Additional Services, District shall compensate Service Provider using the terms and conditions in Attachment B, Compensation and Invoicing. With Additional Services the maximum amount of this agreement shall not exceed \$744,692.00. If Additional Services are required, they shall be undertaken by Service Provider only upon issuance of a Task Authorization (TA), Exhibit A, attached hereto and incorporated herein, for said services.
  - (2) An estimate of the level of effort shall be submitted to the District and negotiated for each Task Authorization. Pricing of each Task Authorization shall be governed by the cost and pricing information

attached hereto and made a part of this Agreement as Attachment B, Compensation and Invoicing.

- (3) A Task Authorization shall not be considered effective until the Task Authorization form has been signed by District.
- (4) Service Provider shall bill for Additional Services in accordance with the terms of payment, including the documentation required in this Agreement. In addition, invoices for Additional Services shall cite the appropriate Task Authorization (TA) number.

#### 4. **RECORDS**

- a. Service Provider shall maintain full and complete records of the cost of services performed under this Agreement. Such records shall be open to inspection of District at all reasonable times in the City of San Diego and such records shall be kept for at least three (3) years after the termination of this Agreement.
- b. Such records shall be maintained by Service Provider for a period of three (3) years after completion of services to be performed under this Agreement or until all disputes, appeals, litigation or claims arising from this Agreement have been resolved, whichever is later.
- c. Service Provider understands and agrees that District, at all times under this Agreement, has the right to review project documents and work in progress and to audit financial records, whether or not final, which Service Provider or anyone else associated with the work has prepared or which relate to the work which Service Provider is performing for District pursuant to this Agreement regardless of whether such records have previously been provided to District. Service Provider shall provide District at Service Provider's expense a copy of all such records within five (5) working days of a written request by District. District's right shall also include inspection at reasonable times of the Service Provider's office or

facilities, which are engaged in the performance of services pursuant to this Agreement. Service Provider shall, at no cost to District furnish reasonable facilities and assistance for such review and audit. Service Provider's failure to provide the records within the time requested shall preclude Service Provider from receiving any compensation due under this Agreement until such documents are provided.

5. **SERVICE PROVIDER'S SUB-CONTRACTORS**

- a. It may be necessary for Service Provider to sub-contract for the performance of certain technical services or other services for Service Provider to perform and complete the required services; provided, however, all Service Provider's sub-contractors shall be subject to prior written approval by District. The Service Provider shall remain responsible to District for any and all services and obligations required under this Agreement, whether performed by Service Provider or Service Provider's sub-contractors. Service Provider shall compensate each Service Provider's sub-contractors in the time periods required by law. Any Service Provider's sub-contractors employed by Service Provider shall be independent Service Providers and not agents of District. Service Provider shall insure that Service Provider's sub-contractors satisfy all substantive requirements for the work set forth by this Agreement, including insurance and indemnification.

- b. Listed below are the firms that the District has approved as Service Provider's sub-contractors to provide services under this Agreement:

<u>NAME OF FIRM</u>	<u>TYPE OF SERVICES PROVIDED</u>
Pro-Cal Lighting, Inc.	Systems Integration & Electrical

- c. Service Provider shall also include a clause in its Agreements with Service Provider's sub-contractors which reserves the right, during the performance of this Agreement and for a period of three (3) years



following termination of this Agreement, for a District representative to audit any cost, compensation or settlement resulting from any items set forth in this Agreement. This clause shall also require Service Provider's sub-contractors to retain all necessary records for a period of three (3) years after completion of services to be performed under this Agreement or until all disputes, appeals, litigation or claims arising from this Agreement have been resolved, whichever is later.

6. **COMPLIANCE**

- a. In performance of this Agreement, Service Provider and Service Provider's sub-contractors shall comply with the California Fair Employment and Housing Act, the American with Disabilities Act, and all other applicable federal, state, and local laws prohibiting discrimination, including without limitation, laws prohibiting discrimination because of age, ancestry, color, creed, denial of family and medical care leave, disability, marital status, medical condition, national origin, race, religion, sex, or sexual orientation. Service Provider shall comply with the prevailing wage provisions of the Labor Code, and the Political Reform Act provisions of the Government Code, as applicable.
- b. Service Provider shall comply with all Federal, State, regional and local laws, and district Ordinances and Regulations applicable to the performance of services under this Agreement as exist now or as may be added or amended.

7. **INDEPENDENT ANALYSIS.** Service Provider shall provide the services required by this Agreement and arrive at conclusions with respect to the rendition of information, advice or recommendations, independent of the control and direction of District, other than normal contract monitoring provided, however, Service Provider shall possess no authority with respect to any District decision.

8. **ASSIGNMENT.** This is a personal services Agreement between the parties and Service Provider shall not assign or transfer voluntarily or involuntarily any of its

rights, duties, or obligations under this Agreement without the express written consent of Executive Director (President/CEO) of District in each instance.

9. **INDEMNIFY, DEFEND, HOLD HARMLESS**

- a. **Duty to Indemnify, duty to defend and hold harmless.** To the fullest extent provided by law, Service Provider agrees to defend, indemnify and hold harmless the District, its agents, officers or employees, from and against any claim, demand, action, proceeding, suit, liability, damage, cost (including reasonable attorneys' fees) or expense for, including but not limited to, damage to property, the loss or use thereof, or injury or death to any person, including Service Provider's officers, agents, subcontractors, employees, ("Claim"), caused by, arising out of, or related to the performance of services by Service Provider as provided for in this Agreement, or failure to act by Service Provider, its officers, agents, subcontractors and employees. The Service Provider's duty to defend, indemnify, and hold harmless shall not include any Claim arising from the active negligence, sole negligence or willful misconduct of the District, its agents, officers, or employees.
- b. The Service Provider further agrees that the duty to indemnify, and the duty to defend the District as set forth in 9.a, requires that Service Provider pay all reasonable attorneys' fees and costs District incurs associated with or related to enforcing the indemnification provisions, and defending any Claim arising from the services of the Service Provider provided for in this Agreement.
- c. The District may, at its own election, conduct its defense, or participate in the defense of any Claim related in any way to this Agreement. If the District chooses at its own election to conduct its own defense, participate in its own defense or obtain independent legal counsel in defense of any Claim arising from the services of Service Provider provided for in this Agreement, Service Provider agrees to pay all reasonable attorneys' fees and all costs incurred by District.

## 10. **INSURANCE REQUIREMENTS**

a. Service Provider shall at all times during the term of this Agreement maintain, at its expense, the following minimum levels and types of insurance:

(1) Commercial General Liability (including, without limitation, Contractual Liability, Personal Injury, Advertising Injury, and Products/Completed Operations) coverages, with coverage at least as broad as Insurance Services Office Commercial General Liability Coverage (occurrence Form CG 0001) with limits no less than one million dollars (\$1,000,000) per Occurrence and two million dollars (\$2,000,000) Aggregate for bodily injury, personal injury and property damage.

(a) The deductible or self-insured retention on this Commercial General Liability shall not exceed \$5,000 unless District has approved of a higher deductible or self-insured retention in writing.

(b) The Commercial General Liability policy shall be endorsed to include the District; its agents, officers and employees as additional insureds in the form as required by the District. An exemplar endorsement is attached (Exhibit B, Certificate of Insurance, attached hereto and incorporated herein).

(c) The coverage provided to the District, as an additional insured, shall be primary and any insurance or self-insurance maintained by the District shall be excess of the Service Provider's insurance and shall not contribute to it.

(d) The Commercial General Liability policy shall be endorsed to include a waiver of transfer of rights of recovery against the District ("Waiver of Subrogation").

- (2) Commercial Automobile Liability (Owned, Scheduled, Non-Owned, or Hired Automobiles) written at least as broad as Insurance Services Office Form Number CA 0001 with limits of no less than one million dollars (\$1,000,000) combined single limit per accident for bodily injury and property damage.
- (3) Workers' Compensation, statutory limits, is required of the Service Provider and all sub-consultants (or be a qualified self-insured) under the applicable laws and in accordance with "Workers' Compensation and Insurance Act", Division IV of the Labor Code of the State of California and any Acts amendatory thereof. Employer's Liability, in an amount of not less than one million dollars (\$1,000,000) each accident, \$1,000,000 disease policy limit and \$1,000,000 disease each employee. This policy shall be endorsed to include a waiver of subrogation endorsement, where permitted by law.

Where the work is on or near navigable water, proof of Longshore & Harbor Workers' Compensation Act (LHWCA formerly USL&H) and Jones Act coverages **will apply** for any employees covered by the Act(s). **Contractor can either provide proof of coverage or evidence from the Division of Longshore and Harbor Workers' Compensation Office that this project falls outside of the LHWCA site/status test.**

- (4) Professional Liability insurance in the amount of \$1,000,000 per claim and \$1,000,000 aggregate.
  - (a) At the end of the agreement period, Consultant shall maintain, at its own expense, continued Professional Liability insurance of not less than five (5) years, in an amount no less than the amount required pursuant to this Agreement.

- (b) Alternately, if the existing Professional Liability is terminated during the above referenced five-year period, Consultant shall maintain at its own expense, "tail" coverage in the same minimum amount as set forth in this paragraph.
    - (c) All coverages under this section shall be effective as of the effective date of this Agreement or provide for a retroactive date of placement that coincides with the effective date of this Agreement.
  - (5) Umbrella or Excess Liability insurance with limits no less than one million dollars (\$1,000,000) per occurrence and aggregate. This policy must provide excess insurance over the same terms and conditions required above for the General Liability, Automobile Liability and Employer's Liability policies.
- b. Service Provider shall furnish District with certificates of insurance coverage for all the policies described above upon execution of this Agreement and upon renewal of any of these policies. A Certificate of Insurance in a form acceptable to the District, an exemplar Certificate of Insurance is attached as Exhibit B and made a part hereof, evidencing the existence of the necessary insurance policies and endorsements required shall be kept on file with the District. Except in the event of cancellation for non-payment of premium, in which case notice shall be 10 days, all such policies must be endorsed so that the insurer(s) must notify the District in writing at least 30 days in advance of policy cancellation. Service Provider shall also provide notice to District prior to cancellation of, or any change in, the stated coverages of insurance.
- c. The Certificate of Insurance must delineate the name of the insurance company affording coverage and the policy number(s) specifically referenced to each type of insurance, either on the face of the certificate or on an attachment thereto. If an addendum setting forth multiple

insurance companies or underwriters is attached to the certificate of insurance, the addendum shall indicate the insurance carrier or underwriter who is the lead carrier and the applicable policy number for the CGL coverage.

- d. Furnishing insurance specified herein by the District will in no way relieve or limit any responsibility or obligation imposed by the Agreement or otherwise on Service Provider or Service Provider's sub-contractors or any tier of Service Provider's sub-contractors. District shall reserve the right to obtain complete copies of any of the insurance policies required herein.
11. **ACCURACY OF SERVICES.** Service Provider shall be responsible for the technical accuracy of its services and documents resulting therefrom and District shall not be responsible for discovering deficiencies therein. Service Provider shall correct such deficiencies without additional compensation. Furthermore, Service Provider expressly agrees to reimburse District for any costs incurred as a result of such deficiencies. Service Provider shall make decisions and carry out its responsibilities hereunder in a timely manner and shall bear all costs incident thereto so as not to delay the District, the project, or any other person related to the project, including the Service Provider or its agents, employees, or subcontractors.
  12. **INDEPENDENT CONTRACTOR.** Service Provider and any agent or employee of Service Provider shall act in an independent capacity and not as officers or employees of District. The District assumes no liability for the Service Provider's actions and performance, nor assumes responsibility for taxes, bonds, payments or other commitments, implied or explicit by or for the Service Provider. Service Provider shall not have authority to act as an agent on behalf of the District unless specifically authorized to do so in writing. Service Provider acknowledges that it is aware that because it is an independent contractor, District is making no deductions from its fee and is not contributing to any fund on its behalf. Service

Provider disclaims the right to any fee or benefits except as expressly provided for in this Agreement.

13. **ADVICE OF COUNSEL.** The parties agree that they are aware that they have the right to be advised by counsel with respect to the negotiations, terms and conditions of this Agreement, and that the decision of whether or not to seek the advice of counsel with respect to this Agreement is a decision which is the sole responsibility of each of the parties hereto. This Agreement shall not be construed in favor of or against either party by reason of the extent to which each party participated in the drafting of the Agreement. The formation, interpretation and performance of this Agreement shall be governed by the laws of the State of California.
14. **INDEPENDENT REVIEW.** Each party hereto declares and represents that in entering into this Agreement it has relied and is relying solely upon its own judgment, belief and knowledge of the nature, extent, effect and consequence relating thereto. Each party further declares and represents that this Agreement is being made without reliance upon any statement or representation not contained herein of any other party, or any representative, agent or attorney of any other party.
15. **INTEGRATION AND MODIFICATION.** This Agreement contains the entire Agreement between the parties and supersedes all prior negotiations, discussion, obligations and rights of the parties in respect of each other regarding the subject matter of this Agreement. There is no other written or oral understanding between the parties. No modifications, amendment or alteration of this Agreement shall be valid unless it is in writing and signed by the parties hereto.
16. **OWNERSHIP OF RECORDS.** Any and all materials and documents, including without limitation drawings, specifications, computations, designs, plans, investigations and reports, prepared by Service Provider pursuant to this Agreement, shall be the property of District from the moment of their preparation

and the Service Provider shall deliver such materials and documents to District at the Don L. Nay Port Administration Building (located at 3165 Pacific Highway, San Diego, California 92101) whenever requested to do so by District. However, Service Provider shall have the right to make duplicate copies of such materials and documents for its own file, or other purposes as may be expressly authorized in writing by District. Said materials and documents prepared or acquired by Service Provider pursuant to this Agreement (including any duplicate copies kept by the Service Provider) shall not be shown to any other public or private person or entity, except as authorized by District. Service Provider shall not disclose to any other public or private person or entity any information regarding the activities of District, except as expressly authorized in writing by District.

17. **TERMINATION.** In addition to any other rights and remedies allowed by law, the Executive Director (President/CEO) of District may terminate this Agreement at any time with or without cause by giving thirty (30) days written notice to Service Provider of such termination and specifying the effective date thereof. In that event, all finished or unfinished documents and other materials shall at the option of District be delivered by Service Provider to the Don L. Nay Port Administration Building (located at 3165 Pacific Highway, San Diego, California 92101). Termination of this Agreement by Executive Director (President/CEO) as provided in this paragraph shall release District from any further fee or claim hereunder by Service Provider other than the fee earned for services which were performed prior to termination but not yet paid. Said fee shall be calculated and based on the schedule as provided in this Agreement.

18. **DISPUTE RESOLUTION**

- a. If a dispute arises out of or relates to this Agreement, or the alleged breach thereof, and is not settled by direct negotiation or such other procedures as may be agreed, and if such dispute is not otherwise time barred, the parties agree to first try in good faith to settle the dispute amicably by mediation administered at San Diego, California, by the American Arbitration Association, or by such other provider as the parties



may mutually select, prior to initiating any litigation or arbitration. Notice of any such dispute must be filed in writing with the other party within a reasonable time after the dispute has arisen. Any resultant Agreements shall be documented and may be used as the basis for an amendment or directive as appropriate.

- b. If mediation is unsuccessful in settling all disputes that are not otherwise time barred, and if both parties agree, any still unresolved disputes may be resolved by arbitration administered at San Diego, California, by the American Arbitration Association, or by such other provider as the parties may mutually select, provided, however, that the Arbitration Award shall be non-binding and advisory only. Any resultant Agreements shall be documented and may be used as the basis for an amendment or directive as appropriate. On demand of the arbitrator or any party to this Agreement, sub-contractor and all parties bound by this arbitration provision agree to join in and become parties to the arbitration proceeding.
- c. The foregoing mediation and arbitration procedures notwithstanding, all claim filing requirements of the Agreement documents, the California Government Code, and otherwise, shall remain in full force and effect regardless of whether or not such dispute avoidance and resolution procedures have been implemented, and the time periods within which claims are to be filed or presented to the District Clerk as required by said Agreement, Government Code, and otherwise, shall not be waived, extended or tolled thereby. If a claim is not timely filed or presented, such claim shall be time barred and the above dispute avoidance and resolution procedures, whether or not implemented or then pending, shall likewise be time barred as to such claims.

19. **PAYMENT BY DISTRICT.** Payment by the District pursuant to this Agreement does not represent that the District has made a detailed examination, audit, or arithmetic verification of the documentation submitted for payment by the Service Provider, made an exhaustive inspection to check the quality or quantity of the

services performed by the Service Provider, made an examination to ascertain how or for what purpose the Service Provider has used money previously paid on account by the District, or constitute a waiver of claims against the Service Provider by the District. The District may in its sole discretion withhold payments or seek reimbursement from the Service Provider for expenses, miscellaneous charges, or other liabilities or increased costs incurred or anticipated by the District which are the fault of or as result of work performed or negligent conduct by or on behalf of the Service Provider. Upon five (5) day written notice to the Service Provider, the District shall have the right to estimate the amount of expenses, miscellaneous charges, or other liabilities or increased costs and to cause the Service Provider to pay the same; and the amount due the Service Provider under this Agreement or the whole or so much of the money due or to become due to the Service Provider under this Agreement as may be considered reasonably necessary by the District shall be retained by the District until such expenses, miscellaneous charges, or other liabilities or increased costs shall have been corrected or otherwise disposed of by the Service Provider at no expense to the District. If such expenses, miscellaneous charges, or other liabilities or increased costs are not corrected or otherwise disposed of at no expense to the District prior to completion date of the Agreement, the District is authorized to pay for such expenses, miscellaneous charges, or other liabilities or increased costs from the amounts retained as outlined above or to seek reimbursement of same from the Service Provider. It is the express intent of the parties to this Agreement to protect the District from loss because of conduct by or on behalf of the Service Provider.

20. **COMPLIANCE WITH PREVAILING WAGE LAWS (IF APPLICABLE)**

- a. Service Provider acknowledges and agrees that it is the sole and exclusive responsibility of Service Provider to: (a) ensure that all persons and/or entities (including, but not limited to, Service Provider or Subcontractors) who provide any labor, services, equipment and/or materials (collectively, "Services") in connection with any work shall comply with the requirements of California's and any other prevailing wage

laws ("PWL") to the extent such laws are applicable and (b) determine whether any Services are subject to the PWL by obtaining a determination by means that do not involve the District.

- b. Certified Payrolls. Service Provider acknowledges and agrees that it is the sole and exclusive responsibility of the Service Provider to insure that all certified payrolls are provided to the District. Service Provider shall submit certified payrolls electronically via the software LCPtracker.
- (1) LCPtracker is a web-based system, accessed on the World Wide Web by a web browser. Service Provider will be given a Log-On identification and password to access the San Diego Unified Port District's reporting system upon Service Provider's request.
  - (2) The use of LCPtracker by the Service Provider is mandatory. Access to LCPtracker will be provided at no cost to the Service Provider.
  - (3) In order to utilize LCPtracker, the Service Provider needs a computer and internet access. A digital camera and a scanner may be useful. For more information, go to [www.lcptracker.com](http://www.lcptracker.com). To Login, go to [www.lcptracker.net](http://www.lcptracker.net) and from the homepage, select LOGIN and enter the Username and Password that will be provided to you by the District upon Service Provider's request.
  - (4) Use of the system will entail data entry of weekly payroll information including; employee identification, labor classification, total hours worked and hours worked on this project, wage and benefit rates paid etc. The Service Provider's payroll and accounting software might be capable of generating a 'comma delimited file' that will interface with the software.

- (5) Service Provider must require all lower-tier sub participants the mandatory requirement to use LCPtracker to provide any required labor compliance documentation. Lower-tier sub participants will be given a Log-On identification and password from the Service Provider.
- (6) Training options can be provided to the Service Provider upon request.

21. **SERVICE PROVIDER/CONTRACTOR REGISTRATION PROGRAM (IF APPLICABLE)**

- a. In accordance with the provisions of Labor Code section 1771.1. (a) A contractor or subcontractor shall not be qualified to bid on; be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in this chapter, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.
- b. No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].
- c. No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless

registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

- d. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

22. **CAPTIONS.** The captions by which the paragraphs of this Agreement are identified are for convenience only and shall have no effect upon its interpretation.

23. **EXECUTIVE DIRECTOR'S SIGNATURE.** It is an express condition of this Agreement that said Agreement shall not be complete nor effective until signed by either the Executive Director (President/CEO) or Authorized Designee on behalf of the District and by Authorized Representative of the Service Provider.

- a. Submit all correspondence regarding this Agreement to:

Ernesto Medina, Chief Engineer  
Engineering-Construction  
San Diego Unified Port District  
P.O. Box 120488  
San Diego, CA 92112-0488  
Tel. 619-686-7229  
Email: emedina@portofsandiego.org

- b. The Service Provider's Authorized Representative assigned below has the authority to authorize changes to the scope, terms and conditions of this Agreement:

Philip E. Waterman, President  
Southern Contracting Company  
559 N. Twin Oaks Valley Rd.  
San Marcos, CA 92069  
Tel. 760-744-0760  
Email: pwaterman@southerncontracting.com

- c. Written notification to the other party shall be provided, in advance, of changes in the name or address of the designated Authorized Representative.

**SAN DIEGO UNIFIED PORT DISTRICT****SOUTHERN CONTRACTING  
COMPANY**

\_\_\_\_\_  
Ernesto Medina  
Chief Engineer, Engineering-Construction

*Philip E. Waterman*  
\_\_\_\_\_  
Philip E. Waterman  
President

Approved as to form and legality:  
GENERAL COUNSEL

\_\_\_\_\_  
By: Assistant/Deputy

A manually signed copy of this Agreement transmitted by email or any other means of electronic transmission shall be deemed to have the same legal effect as delivery of an original signed copy of this Agreement.

**ATTACHMENT A**  
**SCOPE OF SERVICES**  
**San Diego Unified Port District**

**GENERAL DESCRIPTION**

Southern Contracting Company and Pro-Cal Lighting, Inc. (Contractor) shall provide contracting services for the temporary installation of luminaires for the mock-up testing (mock-up test or proposed project) for the San Diego Unified Port District's (District) that is needed in order to create a project description for the San Diego-Coronado Bridge Lighting Project. The mock-up will conduct testing of artistic lighting on three overwater bridge piers near center span of San Diego-Coronado Bridge (Bridge). The lighting will consist of programmable light emitting diode (LED) luminaires temporarily attached to the Bridge. Testing will be conducted for seven consecutive nights for a period of four to six hours per night on Piers 16 to 18 of the Bridge. The mock-up will be conducted utilizing luminaires supplied by Philips Color Kinetics. The Service Provider shall provide the following services:

**PART A – MOCK-UP**

**A. Permit Support**

1. This agreement was prepared in advance of Caltrans Encroachment Permit, U.S. Army Corps of Engineers Permit, and Coastal Development Permit (collectively, Permits) final acceptance. Acceptance and receipt of these Permits will be received after the agreement award, and Service Provider shall be responsible to meet all the requirements of the Permits and shall adjust Service Providers' work as outlined in their initial work plan accordingly at no additional cost to the District. Service Provider shall support the District in coordination with Caltrans Encroachment Permit, to include but not limited to:
  - a. Assistance to the District in developing luminaire support system design and fabrication drawings for Caltrans approval prior to Caltrans' issuing of encroachment permit.
  - b. Submittal of Service Provider's work plan as part of the Caltrans encroachment permit application.
  - c. Attendance at up to two (2) coordination meetings with the District and Caltrans at the Caltrans District 11 main offices in Old Town San Diego, 4050 Taylor St, San Diego, CA 92110.

**B. Mock-up**

1. Furnish all labor, materials, equipment, supplies, transportation, and disposal, as necessary, to complete the construction of the proposed project, including the temporary installation and removal of luminaires and lighting equipment on the Bridge pier numbers 16-18. The proposed project will utilize fully controllable light-emitting diode (LED) luminaires. The luminaires will be on for a period of up to seven consecutive nights between dusk until midnight. Work for the temporary installation of lights shall be conducted from the existing Bridge maintenance catwalk and Service Provider-supplied boat and/or barge, as needed, and will consist of the temporary attachment of luminaires and associated equipment onto the Bridge without any impacts to the bridge structure, including drilling or cutting.
2. The work shall include, but not be limited to the following, as shown in the Concept Plans and

Performance Specifications, Appendices A and B, respectively, and described herein:

- a. Procurement, temporary installation, and removal of Philips Color Kinetics LED luminaires, wires, connections, lighting control systems, and wireless transmitters and receivers on the Bridge piers numbers 16-18 per the concept drawings and performance specs shown in Appendices A and B, respectively.
  - b. Appendix A, Concept Drawings, are District concept drawings and Service Provider shall accept full responsibility for the design, fabrication, and temporary installation and removal of luminaires to the satisfaction of District consultants Studio Fink and Speirs + Major.
  - c. Prepare and submit luminaire support systems and fabrication drawings for District and Caltrans approval.
  - d. Provide pre- and on-site field support to ensure all equipment is fully commissioned, tested, programmed, and coordinated with the District's design consultants Studio Fink and Speirs + Major.
    - 1) The Coastal Development Permit allows for luminaires to be displayed for a maximum of 7 consecutive nights. All luminaires and equipment shall be installed and operational by June 28, 2020. Luminaire and equipment testing shall be conducted on the nights of June 28 through June 30, 2020, from dusk until midnight. All luminaire and lighting control systems shall be tested and approved by the District's consultants Studio Fink and Speirs + Major on or before July 1, 2020.
    - 2) Full public display of mock-up lighting shall be from July 1 through July 4, 2020, from dusk until midnight.
    - 3) Service Provider shall set up the luminaires and assist with their focus and angles and perform any required adjustments as may be determined by the District's consultants Studio Fink and Speirs + Major.
3. Supply temporary power to all luminaires and control equipment as required to conduct the mock-up test.
  4. Operate and control the luminaires and lighting systems for seven consecutive nights from dusk until midnight per the District's design consultants' lighting controls scheme and artist's programming.
    - a. Provide communication by means of two-way radio between the District consultants and Service Provider.
  5. Provide continuous, comprehensive support throughout the duration of the mock-up test. Service Provider shall provide on-site support to ensure any issues with the programming that may arise can be met with immediate response.
  6. Remove all LED luminaires and associated equipment and controls within seven days after completion of the seven-day mock-up testing period and return luminaires and associated equipment to the District.
  7. Service Provider is solely responsible for job site safety.
    - a. Installation and removal of safety scaffolding and fall protection.
    - b. Service Provider shall be responsible for the installation of protective measures to prevent any construction debris and equipment from entering the bay. Installation of such safety measures shall not interfere with artistic lighting effects of the luminaires. Should interference occur, in the opinion of District's consultants Studio Fink and Speirs + Major, Service Provider



shall adjust or relocate the safety measures, as needed, without compromising safety.

8. Throughout all phases of construction and until final completion of the specified Contract Work, Service Provider shall keep the project site clean and free from rubbish, debris, and other loose materials generated by Service Provider operations. No rubbish, debris, and other loose materials shall be allowed to enter the San Diego bay.
9. Service Provider shall coordinate the final lighting programming with the District's consultants Studio Fink and Speirs + Major and shall obtain District approval of a fully functioning lighting program prior to the start of the mock-up test.
10. The Service Provider will be responsible for securing boats(s) and/or barge(s) alongside Bridge pier no. 18, as needed, to facilitate installation of luminaires and equipment at the base of this pier. Service Provider will be responsible for repair of any damage that may result from the use Service Provider's use boats and/or barges for this purpose.
11. The boats/barges may be used for the following activities:
  - a. Luminaire and equipment installation required to illuminate the base of Pier 18 as detailed in Appendix A, Concept Drawings.

## **PART B – EQUIPMENT PROCUREMENT**

- A. The mock-up will be conducted utilizing luminaires supplied by Philips Color Kinetics as detailed in Appendix B, Performance Specifications.

## **ASSUMPTIONS**

The not-to-exceed fee is based on the anticipated work including:

- A. Working hours:

1. Luminaire and equipment installation: Installation shall be completed during the hours of 7 a.m. and 4:00 p.m. Monday through Friday, or as determined by the District and Caltrans. Service Provider may adjust working hours and days to ensure luminaires and equipment are installed and operational on or before June 28, 2020.
2. Luminaire and equipment testing: Testing of luminaires and equipment shall be tested on June 28, 2020 through June 30, 2020, from dusk until midnight or as determined by the District.
3. Mock-up testing: During operation of the mock-up testing on the nights of July 1, 2020 through July 4, 2020, normal working hours shall be one hour prior to dusk until 1:00 AM, unless otherwise indicated.
4. Luminaire and equipment removal: Removal of luminaires and equipment shall be within seven (7) days from end of the mock-up on July 5, 2020, or as determined by the District and Caltrans.

- B. Access to the top of piers 16-18 shall be accomplished via use of the Bridge's installed maintenance catwalk, and access to the base of pier 18 shall be achieved via Service Provider- supplied boat and/or barge. Access to the Bridge maintenance catwalk shall be from the Coronado end of the Bridge, which is located adjacent to Coronado Tidelands Park.
- C. Electrical facilities on the bridge are not provided for the purpose of the mock-up testing, and Service Provider shall, therefore, provide independent power to complete the work. See Appendices A and B

for concept drawings and performance specifications, respectively, for power requirements.

- D. Luminaire programming is to be provided by the District's consultants Studio Fink and Speirs + Major.
- E. Luminaires, wires, cables, and controllers are to be supplied by the Service Provider.
- F. A Service Provider laydown area will be provided either in the parking lot of Coronado Tidelands Park or adjacent to the Coronado entrance of the Bridge maintenance catwalk, pending Caltrans approval.
- G. Longshoremen Insurance is a requirement for this contract.
- H. The District may arrange and conduct weekly progress meetings. The District will prepare and circulate a draft agenda of each meeting. The Service Provider may add items as appropriate to the draft agenda.

**ATTACHMENT B  
COMPENSATION & INVOICING  
San Diego Unified Port District**

**1. COMPENSATION**

a. For the satisfactory performance and completion of the services under this Agreement, District shall pay Service Provider compensation as set forth hereunder.

(1) Service Provider shall be compensated and reimbursed by District on the basis of invoices submitted each month for services performed during the preceding month. Invoice(s) shall be on a Fixed Fee and/or Time and Materials basis.

(a) Each invoice for Fixed Fee work shall include:

Date work performed;  
Description of the work performed;  
Percent of total work being invoiced;  
Percent of total work completed;  
Direct Costs.

(b) Each invoice for Time and Materials work shall include:

Date work performed;  
Description of the work performed;  
Hours worked by personnel classification;  
Rate per personnel classification;  
Total personnel cost by classification; and  
Direct Costs.

(2) Services shall be invoiced in accordance with the following **Fee Schedule**:

<b>Phase</b>	<b>Activity</b>	<b>Fee</b>
A – Mock-Up	Permit Support, Mock-Up installation and removal, longshoremen insurance	\$ 303,835.00
B – Equipment Procurement	Luminaire and equipment procurement	\$ 440,857.00
Agreement Total Not to Exceed Amount		\$ 744,692.00

(a) Upon consent of District Representative, the amounts allocated for each phase above may be adjusted, as needed, provided that the Total Not to Exceed Amount will not be exceeded.

- (b) Additional fixed fees, labor classifications and fully burdened hourly rates not listed in the Fee Schedule above may be authorized with the approval of the District's Project Manager.

b. **Reimbursable Expenses**

Sub-Contractor Costs	0% mark-up
Direct Costs	At Cost (zero mark-up)

**Note:** Reimbursement for other costs in excess of \$50.00 shall require the advance written approval by District's Project Manager. All project related direct costs shall require appropriate documentation for reimbursement.

2. **INVOICING**

- a. **Payment Documentation.** As a prerequisite to payment for services, Service Provider shall invoice District for services performed and for reimbursable expenses authorized by this Agreement, accompanied by such records, receipts and forms as required.
- b. Service Provider shall include the following information on each invoice submitted for payment by District, in addition to the information required in Section 1, above:
- 1) Agreement No. 10-2020MA
  - 2) If applicable, the Task Authorization(s) (TA) number being charged.
  - 3) The following certification phrase, with printed name, title and signature of Service Provider's project manager or designated representative:  
  

"I certify under penalty of perjury that the above statement is just and correct according to the terms of Document No. \_\_\_\_\_, and that payment has not been received."
  - 4) Dates of service provided
  - 5) Date of invoice
  - 6) A unique invoice number
- c. District shall, at its discretion, return to Service Provider, without payment, any invoice, which has been submitted without the above information and certification phrase.
- d. Invoices shall be emailed to: Allan Tait, [altait@portofsandiego.org](mailto:altait@portofsandiego.org) and/or mailed to the attention of Allant Tait, Senior Project Manager, Waterfront

Arts & Activation, San Diego Unified Port District, P.O. Box 120488, San Diego, CA 92112-0488.

- e. Should District contest any portion of an invoice, that portion shall be held for resolution, but the uncontested balance shall be processed for payment. District may, at any time, conduct an audit of any and all records kept by Service Provider for the Services. Any overpayment discovered in such an audit may be charged against the Service Provider's future invoices and any retention funds.
- f. Service Provider shall submit all invoices within thirty (30) days of completion of work represented by the request and within sixty (60) days of incurring costs to be reimbursed under the Agreement. Payment will be made to Service Provider within thirty (30) days after receipt by District of a proper invoice.

**EXHIBIT A**  
**TASK AUTHORIZATION FORM**  
**San Diego Unified Port District**



**(DEPARTMENT NAME)**

*San Diego Unified Port District*

*P.O. Box 120488*

*San Diego, CA 92112-0488*

*(619) 686-\_\_\_\_*

*Fax (619) 725-\_\_\_\_*

**TASK AUTHORIZATION NO. \_**

(Date)

(Name)

(Title)

(Name of Company)

(Address)

(City, State, Zip)

Email:

**Subject: Task Authorization for Agreement No. \_ - 20\_**  
 (Agreement Title)

You are authorized to proceed with the work described in this correspondence, in an amount not to exceed \$\_\_\_\_\_. This Task Authorization is in accordance with the terms of the subject agreement. **Please cite TA #\_** on invoice(s) for this Task.

**TASK DESCRIPTION**

1.	Requestor:		4.	WBS or IO/ Cost Center:	
2.	Date of Request:		5.	Task Start Date:	
3.	Task Budget:	\$	6.	Task End Date:	
7.	<b>Task Title:</b>				

8. **Scope of Services.**

**9. Contractor Staffing (If applicable)**

Name	Classification	Hours
	Staff as needed per Agreement rates	

**10. List of Sub-Contractors (If applicable)**

N/A

11. Please acknowledge acceptance of this Task Authorization by signing below and returning via mail to \_\_\_\_\_, Contracts Administrator, at the address above.

**APPROVALS****Service Provider:**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

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

Firm: \_\_\_\_\_

Date: \_\_\_\_\_

**Project Manager:**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: Project Manager

Date: \_\_\_\_\_

**Manager:**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: Manager

Date: \_\_\_\_\_

**Director/Chief Engineer:**

Signature: \_\_\_\_\_

Name: \_\_\_\_\_

Title: Director/Chief Engineer

Date: \_\_\_\_\_

**EXHIBIT B**  
**CERTIFICATE OF INSURANCE**  
**San Diego Unified Port District**

By signing this form, the authorized agent or broker **certifies** the following:

- (1) The Policy or Policies described below have been issued by the noted Insurer(s) [Insurance Company(ies)] to the Insured and is (are) in force at this time.
- (2) As required in the Insured's agreement(s) with the District, the policies include, or have been endorsed to include, the coverages or conditions of coverage **noted on page 2 of this certificate**.
- (3) Signed copies of **all** endorsements issued to effect require coverages or conditions of coverage are attached to this certificate.

**Return this form to:**

**San Diego Unified Port District**  
**c/o Ebix BPO**  
**P.O. Box 100085 – 185**  
**Duluth, GA 30096 – OR –**  
**Email: [portofsandiego@ebix.com](mailto:portofsandiego@ebix.com)**  
**Fax: 1-866-866-6516**

Name and Address of Insured (Consultant)

SDUPD Agreement Number: \_\_\_\_\_

This certificate applies to all operations of named insureds on District property in connection with all agreements between the District and Insured.

CO LTR	TYPE OF INSURANCE	POLICY NO.	DATES	LIMITS
	<b>Commercial General Liability</b> <input type="checkbox"/> Occurrence Form <input type="checkbox"/> Claims-made Form Retro Date _____ <input type="checkbox"/> Liquor Liability Deductible/SIR: \$ _____		<b>Commencement Date:</b>  <b>Expiration Date:</b>	<b>Each Occurrence:</b> \$ _____  <b>General Aggregate:</b> \$ _____
	<b>Commercial Automobile Liability</b> <input type="checkbox"/> All Autos <input type="checkbox"/> Owned Autos <input type="checkbox"/> Non-Owned & Hired Autos		<b>Commencement Date:</b>  <b>Expiration Date:</b>	<b>Each Occurrence:</b> \$ _____
	<b>Workers Compensation – Statutory</b> Employer's Liability		<b>Commencement Date:</b>  <b>Expiration Date:</b>	E.L. Each Accident \$ _____ E.L. Disease Each Employee \$ _____ E.L. Disease Policy Limit \$ _____
	<b>Professional Liability</b> <input type="checkbox"/> Claims Made Retro-Active Date _____		<b>Commencement Date:</b>  <b>Expiration Date:</b>	Each Claim \$ _____ \$ _____
	<b>Excess/Umbrella Liability</b>		<b>Commencement Date:</b>  <b>Expiration Date:</b>	Each Occurrence: \$ _____ General Aggregate: \$ _____
<b>CO LTR</b>	<b>COMPANIES AFFORDING COVERAGE</b>			<b>A. M. BEST RATING</b>
A				
B				
C				
D				
<b>A. M. Best Financial Ratings of Insurance Companies Affording Coverage Must be A-VII or better unless approved in writing by the District.</b>				
Name and Address of Authorized Agent(s) or Broker(s)			E-mail Address:	
			Phone:	Fax Number:
			Signature of Authorized Agent(s) or Broker(s)	
			Date:	



**SAN DIEGO UNIFIED PORT DISTRICT**  
**REQUIRED INSURANCE ENDORSEMENT**

<b><u>ENDORSEMENT NO.</u></b>	<b><u>EFFECTIVE DATE</u></b>	<b><u>POLICY NO.</u></b>
<b>NAMED INSURED:</b>		
<b>GENERAL DESCRIPTION OF AGREEMENT(S) AND/OR ACTIVITY(IES):</b> All written agreements, contracts and leases with the San Diego Unified Port District and any and all activities or work performed on district premises		

**Notwithstanding any inconsistent statement in the policy to which this endorsement is attached or in any endorsement now or hereafter attached thereto, it is agreed as follows:**

1. The San Diego Unified Port District, its officers, agents, and employees are additional insureds in relation to those operations, uses, occupations, acts, and activities described generally above, including activities of the named insured, its officers, agents, employees or invitees, or activities performed on behalf of the named insured.
2. Insurance under the policy(ies) listed on this endorsement is primary and no other insurance or self-insured retention carried by the San Diego Unified Port District will be called upon to contribute to a loss covered by insurance for the named insured.
3. This endorsement shall include a waiver of transfer of rights of recovery against the San Diego Unified Port District ("Waiver of Subrogation").
4. The policy(ies) listed on this endorsement will apply separately to each insured against whom claim is made or suit is brought except with respect to the limits of the insurer's liability.
5. As respects the policy(ies) listed on this endorsement, with the exception of cancellation due to nonpayment of premium, thirty (30) days written notice by certified mail, return receipt requested, will be given to the San Diego Unified Port District prior to the effective date of cancellation. In the event of cancellation due to nonpayment of premium, ten (10) days written notice shall be given.

Except as stated above, and not in conflict with this endorsement, nothing contained herein shall be held to waive, alter or extend any of the limits, agreements or exclusions of the policy(ies) to which this endorsement applies.

\_\_\_\_\_  
(NAME OF INSURANCE COMPANY)

\_\_\_\_\_  
(SIGNATURE OF INSURANCE COMPANY AUTHORIZED REPRESENTATIVE)

**MAIL THIS ENDORSEMENT AND NOTICES OF CANCELLATION:**

San Diego Unified Port District  
c/o Ebix BPO  
P.O. Box 100085 – 185  
Duluth, GA 30096 – OR –  
Email to: [portofsandiego@ebix.com](mailto:portofsandiego@ebix.com)  
Fax: 1-866-866-6516

# APPENDIX A

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## CONCEPTUAL DRAWINGS



I - GENERAL NOTES

1. SITE SET UP  
THE MOCK UP WILL TAKE PLACE OVER THE LIVE NAVIGATION ROUTE UNDER THE BRIDGE. THE TESTS WILL BE REQUIRED TO RUN SIMULTANEOUSLY ACROSS ALL (4) PIERS - POSITIONS INDICATED ON SHEET 100. THE CONTRACTOR WILL PROVIDE A LOGISTICS PLAN TO CONFIRM THE SPACE REQUIRED, ACCESS AND CONTROL POINTS.  
PROVIDE OUTLINE LOGISTICS PLAN FOR WITH THE TENDER RETURN THE PORT'S TEAM AND CALTRANS TO REVIEW.

THE ASSUMED TIME LINE FOR THE MOCK UP SHOULD BE CONFIRMED BY THE CONTRACTOR, ASA MINIMUM THE FOLLOWING SHOULD BE ASSUMED

- 1. INSTALLATION: 4 DAYS
- 2. ONSITE PROGRAMING AND TESTING: 3 NIGHTS
- 3. DEMONSTRATION / BOAT TRIPS 4 NIGHTS [- 2 NIGHTS VIP AND 2 NIGHTS PUBLIC]
- 4. DECOMMISSION 3 DAYS

AT ALL TIMES THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONDITIONS OF THE JOB SITE INCLUDING SAFETY OF PERSONS AND PROPERTY. THE ARCHITECT'S OR ENGINEER'S PRESENCE OR REVIEW OF WORK DOES NOT INCLUDE THE ADEQUACY OF THE CONTRACTOR'S MEANS OR METHODS OF CONSTRUCTION.

THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE EXISTING AND TEMPORARY STRUCTURE DURING CONSTRUCTION BRACING AND INSTALLATIONS.

ALL EXISTING DIMENSIONS AND LOCATIONS OF EXISTING STRUCTURES SHOWN ON THE DRAWINGS SHALL BE VERIFIED BY FIELD MEASUREMENTS, ANY DISCREPANCIES SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.

THESE SKETCH DRAWINGS HAVE BEEN PREPARED TO DESCRIBE THE SCOPE OF WORKS AND ARE BASED ON AVAILABLE KNOWLEDGE OF EXISTING CONDITIONS. IF, DURING DEMOLITION, EXCAVATION OR CONSTRUCTION, ACTUAL CONDITIONS ARE DISCOVERED TO DIFFER FROM THOSE INDICATED ON DRAWINGS, ENGINEER SHALL BE NOTIFIED.

2. TEMPORARY POWER  
THERE IS NO UTILITY POWER AVAILABLE, THE CONTRACTOR IS TO PROVIDE TEMPORARY POWER. ANY GENERATORS MUST COMPLY WITH ALL OSHA AND NEC (2107). RUNNING WATTAGE IS PROVIDED ON SHEET 100

3. POSITIONING/LOCATION  
TEMPORARY GENERATORS TO HAVE SUITABLE BASE FRAMING AND SUPPORT, AND BE INSTALLED VIA THE MAINTENANCE CATWALK FINAL POSITION OF GENERATORS AND EQUIPMENT TO BE AGREED WITH THE DISTRICT AND CALTRANS.

4. FUEL  
GENERATORS BECOME HOT WHILE RUNNING AND REMAIN HOT FOR LONG PERIODS AFTER THEY ARE STOPPED. BEFORE REFUELING, SHUT DOWN THE GENERATOR AND ALLOW IT TO COOL.  
GASOLINE AND OTHER GENERATOR FUELS SHOULD BE STORED AND TRANSPORTED IN APPROVED CONTAINERS THAT ARE PROPERLY DESIGNED AND MARKED FOR THEIR CONTENTS, AND VENTED.

5. NOISE AND VIBRATION  
GENERATOR ENGINES VIBRATE AND CREATE NOISE. EXCESSIVE NOISE AND VIBRATION COULD CAUSE HEARING LOSS AND FATIGUE THAT MAY AFFECT JOB PERFORMANCE.  
WEAR HEARING PROTECTION IF THIS IS NOT POSSIBLE.

6. GROUNDING  
MAKE SURE A GENERATOR IS PROPERLY GROUNDED AND THE GROUNDING CONNECTIONS ARE TIGHT. CONSULT THE MANUFACTURER'S INSTRUCTIONS FOR PROPER GROUNDING METHODS.  
KEEP A GENERATOR DRY. DO NOT USE IT IN THE RAIN OR WET CONDITIONS. IF NEEDED, PROTECT A GENERATOR WITH A CANOPY. NEVER MANIPULATE A GENERATOR'S ELECTRICAL COMPONENTS IF YOU ARE WET OR STANDING IN WATER.  
USE GROUND FAULT CIRCUIT INTERRUPTERS (GFCIS) ESPECIALLY WHERE ELECTRICAL EQUIPMENT IS USED IN OR AROUND WET OR DAMP LOCATIONS. GFCIS SHUT OFF POWER WHEN AN ELECTRICAL CURRENT IS DETECTED OUTSIDE NORMAL PATHS.

I - STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (LATEST EDITION AND SUPPLEMENTS).

2. STRUCTURAL STEEL SHALL CONFORM TO THE ASTM DESIGNATION A992, GR50, EXCEPT ANGLES, PLATES AND BARS WHICH SHALL CONFORM TO ASTM DESIGNATION A36, UNLESS NOTED OTHERWISE.

3. PIPE STEEL SHALL CONFORM TO ASTM DESIGNATION A53 GRADE "B". ALL STEEL TUBES SHALL CONFORM TO ASTM A500 GRADE "B" COLD FORMED TUBES WITH  $F_y = 46$  KSI.

4. THE FABRICATOR SHALL FURNISH SHOP DRAWINGS OF ALL STRUCTURAL STEEL, FOR ARCHITECTS, ENGINEERS, AND CALTRANS REVIEW BEFORE FABRICATION.

5. BOLTED CONNECTIONS:  
ALL BOLTS SHALL CONFORM TO ASTM A325 OR A490, UNLESS NOTED OTHERWISE. NUTS SHALL CONFORM TO ASTM A563 AND WASHERS SHALL CONFORM TO ASTM F436

BOLT HOLES IN STEEL SHALL BE 1/16 INCH LARGER THAN NOMINAL SIZE OF BOLT USED, EXCEPT ANCHOR BOLT HOLES.

6. WELDED CONNECTIONS:  
ALL WELDS SHALL BE IN ACCORDANCE TO THE WELDING PROCEDURE SPECIFICATION REQUIRED BY AWS D1.1-98. ELECTRODES SHALL HAVE A MINIMUM TENSILE STRENGTH OF 70 KSI.

ALL COMPLETE JOINT PENETRATION (CJP) GROOVE WELDS SHALL BE MADE USING A FILLER METAL THAT HAS A MINIMUM CVN TOUGHNESS OF 20 FT-LBS AT -20 DEGREES FAHRENHEIT. FULL ULTRASONIC INSPECTION SHALL BE PROVIDED ON ALL CJP WELDS CONTAINED IN JOINTS AND SPLICES.

SIZE OF WELDS SHALL NOT BE SMALLER THAN 1/4".

7. TEMPORARY STRUCTURAL STEEL SURFACES CAN BE LEFT UNPAINTED.

8. FABRICATION AND ERECTION CONSIDERATIONS - THE FOLLOWING ITEMS WILL BE AGREED AT THE PRE-DESIGN/KICK OFF MEETING WITH THE CONTRACTOR:

- ELEMENTS AFFECTED BY STEEL ERECTION PROCEDURE, SUCH AS MEMBER SIZES, CONNECTIONS, SPLICES, BASE PLATES, ANCHOR BOLTS, ETC.
- ERECTION PROCEDURES AND SEQUENCES WITH REGARD TO TEMPERATURE EFFECTS.

9. THE CONTRACTOR SHALL PROVIDE, AT NO ADDITIONAL COST, ALL ADDITIONAL STEEL, SHORING, CONNECTIONS, GUYING, ETC REQUIRED FOR ERECTION AND LIFTING.

10. MEMBERS MAY ONLY BE SPLICED WHERE SPECIFICALLY DETAILED ON ACCEPTED SHOP DRAWINGS.

11. FIELD CUTTING OF STRUCTURAL STEEL IS NOT PERMITTED EXCEPT WITH THE PRIOR APPROVAL OF THE ENGINEER.

RECORD DRAWING

REVIEWED BY \_\_\_\_\_

PROJECT MANAGER/ENGINEER \_\_\_\_\_

DATE \_\_\_\_\_

NOTE

THIS DRAWING WILL BE A REDUCED

REFERENCES -

TO VERIFY DRAWING IS A

REPRODUCTION OF THE

CONSTRUCTION SET

ACCORDING TO THE GRAPHIC

SCALES SHOWN.

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

CONTRACTOR: 2024-04

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PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

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CONTRACTOR: 2024-04

CONTRACTOR: 2024-04

DATE: 2/28/24

PROJECT NUMBER: 2024-04

CONTRACT NUMBER: 2024-04

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CONTRACTOR: 2024-04



SAN DIEGO UNIFIED PORT DISTRICT

CORONADO BRIDGE ART LIGHTING

MOCK UP SCOPE

GENERAL NOTES

DATE: 10/21/2023

FILE NO: 24-000004-110

SHEET 2

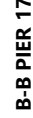
OF 10

PROJECT: 2

DATE: 11-20-24

BY: 648

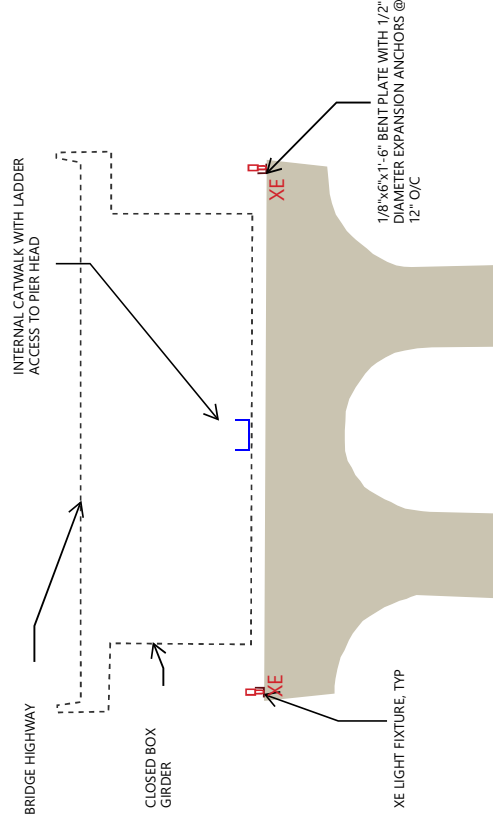
BY: 648



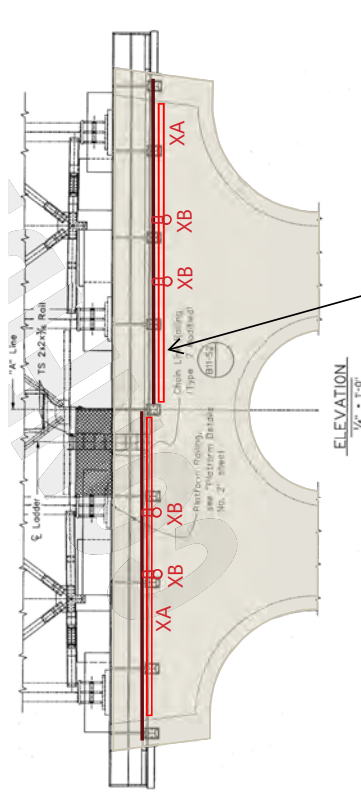
CONTRACTOR MAY USE ALTERNATIVE  
TEMPORARY FRAMING FOR (5) OF (6) BAYS TYPE  
- SKETCH/DESCRIBE THESE IN THE BID RETURNS,  
FINAL SHOP DRAWINGS TO BE APPROVED BY  
ENGINEER & CALTRANS BEFORE INSTALLATION

(1) OF (6) BAYS TO BE INSTALLED  
TO ENGINEERS DETAILS TYP. TO  
MOCK UP THE FINAL PROPOSED  
DETAILS - USING HSS PIPE

R:\CADD\District Borders\POSD-BDR - 34x22.dwg / Sep 05, 2019 - 1:06pm / dtesch

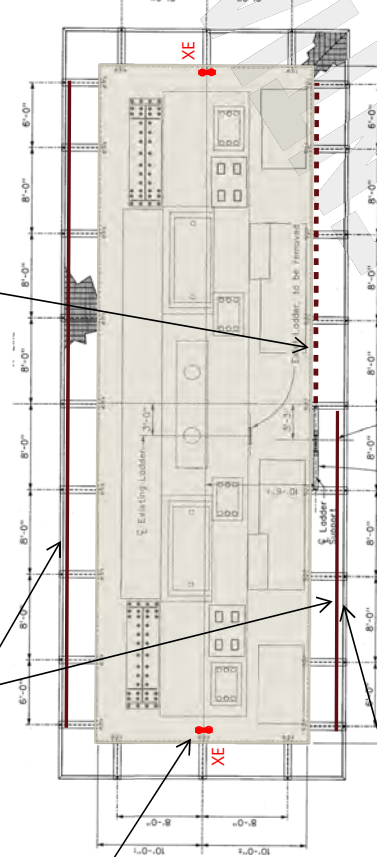


## A-A PARTIAL FRAMING PLAN



3" OD HSS PIPE TYP, CLAMPED TO W-BEAM BELOW OF WALK WAY.  
- INSTALLED FROM CRADLE BELOW

3" OD HSS PIPE TYP, ATTACHED TO  
VERTICAL BALUSTRADE POST  
PROPRIETARY CLAMP, TYP

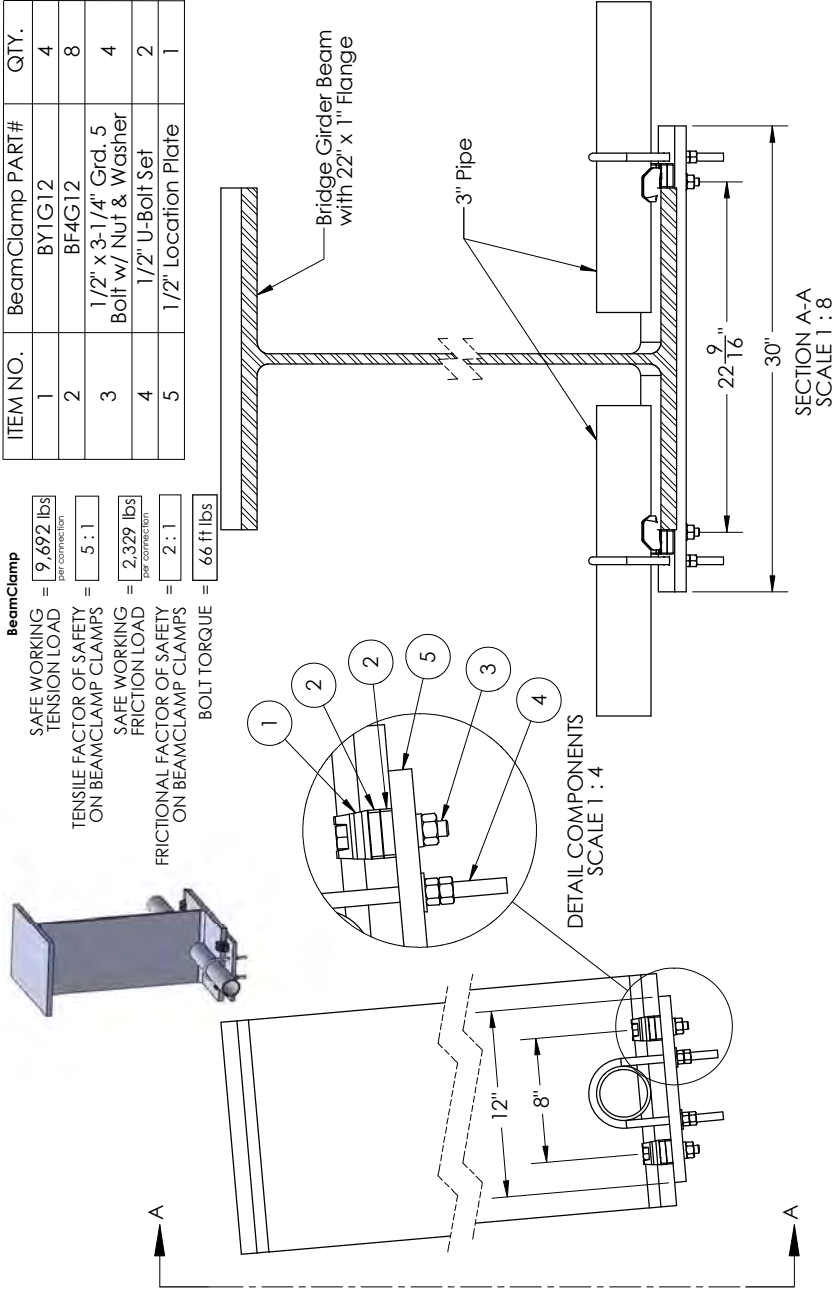


XE LIGHT FIXTURES ATTACHED TO BENT  
PLATE TYPE

THE IMPACT OF THE WALKWAY GRATING WILL BE TESTED AND BASED ON THE ON-SITE TESTING THROUGH NIGHTS 1 AND 2, MAY BE MOVED BELOW: PROVIDE ADD ALTERNATE FOR MOVING PIPE AND FIXTURES BELOW THE WALKWAY

**PLAN VIEW - EXTRACT FROM THE  
EXISTING DRAWING**





LNA BEAM CLAMP BRACKET



RECORD DRAWING REVIEWED BY PROJECT MANAGER/ENGINEER DATE	NOTE THIS DRAWING MAY BE A REDUCED SCALE DRAWING. TO VERIFY DRAWING IS A REDUCED SCALE DRAWING, CHECK THE DIMENSIONS OF THE GRAPHIC SCALES SHOWN. SHEET NO. 10341 PROJECT NO. 2018-04 CONSTRUCTION STARTED CONSTRUCTION COMPLETED COST INSPECTOR	REFERENCE DATE IMPROVED	APPROVAL DESIGNER CHECKED SEAL	APPROVAL REVIEWER CHECKED SEAL	SAN DIEGO UNIFIED PORT DISTRICT CORONADO BRIDGE ART LIGHTING MOCK UP SCOPE HSS TO ORDER CONNECTION	DATE 10/31/2018 SCALE 1/8" = 1'-0" SHEET 6 OF 6 PROJECT TL-2018-04-01	Page 6 of 6



Notes:

Do not scale off this drawing.

All drawings to be read in conjunction with all other relevant documents, including drawings and specifications.

All work to be carried out in accordance with such Standards, Building and Fire regulations, mandatory and statutory regulations and codes of practice as are deemed to apply in the relevant country or state.

Refer to Span-Major Lighting Designer's Risk Assessment for details of the proposed lighting system (Design and Management) Regulations (where applicable).

Symbol Notes (where used):

Symbols indicate positions of luminaires and other equipment.

The alphanumeric reference beside each symbol refers to the equipment schedule in the Span-Major Lighting Equipment Specification.

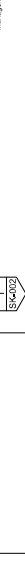
The numeric code beside each symbol refers to a logical control channel reference (NOT the same as a physical wiring circuit). For details of logical channels see relevant wiring circuit. For details of physical channels see relevant wiring circuit. For details of physical channels see relevant wiring circuit, etc. see relevant equipment's drawings.

Copyright:

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IMPORTANT:

IF THE DRAWING IS ISSUED TO CONTRACTORS, IT IS FOR INFORMATION ONLY - ARCHITECTS AND ENGINEERS MUST BE USED AS THE BASIS FOR TENDER AND CONSTRUCTION.





**Notes:**

All drawings to be read in conjunction with all other relevant documents, including drawings and specifications.

Symbol Notes (where used):

Symbols indicate positions of luminaires and other equipment.

The numeric code beside each symbol refers to a logical control channel reference (NOT the same as a physical wiring circuit). For details of logical channels see relevant Symbols+Major Control Channel Schedule. For details of wiring circuits, etc. see relevant engineers' drawings.

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Page 38

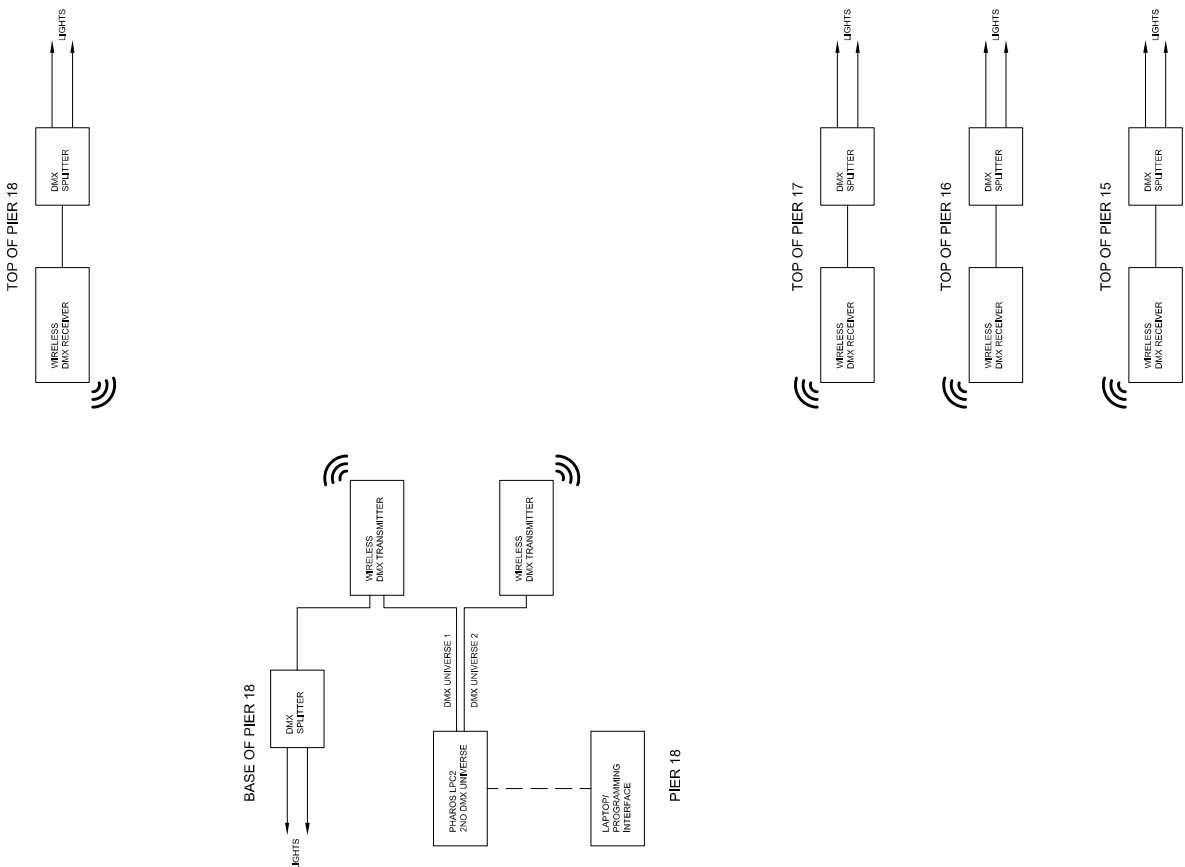
**4** Piers 15, 16 + 17 - End Elevation  
1:200

**3** Plers 15, 16 ÷ 17 - Elevation  
1:200

**1** Plers 15, 16 + 17 - Low Level Plan  
1:200

[illegible]





Lighting Control System Requirements

The following provides the lighting control intent and system requirements for the full scale lighting mock-up over water for the Coronado Bridge project, that demonstrates the artistic effects for the bridge to the relevant stakeholders and visitors to San Diego.

The lighting control system will allow the luminaires to be controlled individually to be able to create and recall lighting effects and sequences of light and color. The system will be controlled by a central computer system and will be programmed and automatically recalled via astronomical time-clock.

The lighting control system and wireless transmitter will be located at the base of Pier 18 adjacent to the low level lighting equipment for the mock-up.

The lighting control system will be fully computerized with all functions identified and addressed, and with wireless DMX transmitter and receiver tested and tested, prior to final testing and programming by the artist for 2 alternate-day-hours programming sessions in the 2 days immediately prior to the start of the mock-up. A system integrator will be required to for the on-site commissioning, testing and programming, see below for full details.

The Lighting Control System will comprise of the following equipment below and the control schematic diagram indicated set:

**Stow Controller - Pharos Architectural Controls LPC2**

Two universal DMX/DMX+ slave controller, using time-based programming. Capable of running multiple astronomical time-clock functions and scheduling. To comply with DMX512A and RDM Version 1.0. To be housed in appropriate weather-proof housing, with separate DC power supply.

By Pharos Architectural Controls - sales@pharoscontrols.com

**Radio DMX transmitter/receiver - LumenRadio CRMX Outdoor Flex**

One universal DMX+ wireless transmitter/receiver, IP67 housing, DMX connectors and the voltage power on screw terminals. To comply with DMX512A and RDM Version 1.0.

By LumenRadio - sales@lumenradio.com

**DMX Splitters**

One universal DMX splitter, with DMX in, two out, at least 2 cables. To comply with DMX512A and RDM Version 1.0. To be housed in appropriate weather-proof housing, with separate power supply if required.

By reputable manufacturer.

**DMX cabling**

Use RS-485 data cable, designed for exterior use (Belden 7200A or similar), with low capacitance and a characteristic impedance of 85 to 150 Ohms. Electrically shielded with at least one twisted pair of conductors. Minimum recommended wire size is 18 AWG for runs up to 300 meters and 14 AWG for runs up to 500 meters.

DMX should always be daisy chained from device to device. It should never be "Y-spliced". A single DMX line can support up to 32 receiving devices. If more than 32 units are required, the DMX must be split using a powered cat5-cabled DMX splitter. DMX should be terminated at the end of the line with a 120 Ohm resistor between the data + and data - connections.

Electrical engineer/contractor/supplier should provide final cable specification appropriate to the project environment, and in compliance with local regulations.

**Systems Integration Responsibilities:**

- Technical design and specification of the lighting control system including controller, wind and weather proof enclosure and providing if necessary. Testing prior to delivery to site for installation.
- Development of networking/addressing/scheduling schema, provision of documentation to the artist.
- Offsite pre-programming of luminaires using 3D visualization model and Pharos controller. This can be undertaken by the artist, or by the system integrator, or by the supplier, or by the artist and the system integrator, or by the artist and the supplier, or by the artist and the system integrator and the supplier, or by the artist and the system integrator and the supplier and the artist.
- On-site pre-programming of luminaires using 3D visualization model and Pharos controller. This can be undertaken by the artist, or by the system integrator, or by the supplier, or by the artist and the system integrator, or by the artist and the supplier, or by the artist and the system integrator and the supplier, or by the artist and the system integrator and the supplier and the artist.
- On-site pre-programming of luminaires using 3D visualization model and Pharos controller. This can be undertaken by the artist, or by the system integrator, or by the supplier, or by the artist and the system integrator, or by the artist and the supplier, or by the artist and the system integrator and the supplier, or by the artist and the system integrator and the supplier and the artist.

**Local supplier/specialist sub-contractor's responsibilities include, but are not limited to:**

- Procurement of control equipment as described in this specification.
- Installation of control equipment and testing prior to delivery to site for installation.
- Establishing cable routes, containment specifications, and cable specifications, and locations of control equipment.
- Designing and specifying mains power distribution to control components and to luminaires, including containment specifications, and cable specifications, installation of luminaires, control equipment and containment specifications, and cable specifications.
- Address luminaires.
- Commission lighting control system to specification and instructions from Spels + Major. Configuration of the system to be installed and tested prior to delivery to site for installation.
- Test and verify the system.
- Focus luminaires and fixture programming on site with Peter Fink and Spels + Major.

Notes:

Do not scale off this drawing.

All drawings to be read in conjunction with all other relevant documents, including drawings and specifications.

All units to be scaled as per specifications with each Standard, Building and EIR regulations, mandatory and statutory regulations and codes of practice as are deemed to apply in the relevant country or state.

Refer to Spels+Major Lighting Designer's Risk Assessment Management Regulations (where applicable).

Symbol Note (where used):

Symbols indicate positions of luminaires and other equipment.

The alphanumeric reference beside each symbol refers to the Equipment Specification.

The symbolic code beside each symbol refers to the logical control channel reference (NOT the same as a physical wiring circuit). For details of logical channels see relevant wiring details, etc. see relevant engineer's drawings.

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**IMPORTANT:**

IF THIS DRAWING IS ISSUED TO CONTRACTORS, IT IS FOR INFORMATION ONLY - ARCHITECTS AND ENGINEERS ARE TO BE USED AS THE BASIS FOR TENDER AND CONSTRUCTION.



RECORD DRAWING  FOR REVIEW BY: _____  PROJECT: SAN DIEGO LIGHTS PLAN _____	<p>THIS DRAWING MAY BE A REDUCED SCALE PRINT OF THE ORIGINAL DRAWINGS. THE ORIGINAL DRAWINGS, UNLESS OTHERWISE NOTED, ARE THE VERIFIED DRAWING IS A REDUCED, AND ADJUST SCALES ACCORDING TO THE ORIGINAL SCALES SHOWN.</p>	SPEC. NO. 2012-14	MBS NO. 133-41	PROJECT NUMBER -	CONTRACTOR -	CONTRACTING PERIOD -	CONTRACTING COMPLETED -	INSPECTOR -	DATE	PROJECT MANAGER/ENGINEER	DATE	DESIGNED	CHECKED	APPROVED	SAN DIEGO UNITED PORT DISTRICT	CORONADO BRIDGE ART LIGHTING MOCK UP SCOPE	DATE 10.09.19	SHEET 10 OF 10	DRAWING NO. 1000000001	REV.
																				
Lighting Control Schematic and Performance Requirements for Lighting Mock-up Piers 15, 16, 17 and 18																				
T.L. 2019-03																				

# APPENDIX B

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## PERFORMANCE SPECIFICATIONS

SPR+MOOR

Coronado Bridge  
San Diego, USA

Revision History  
10000-LP-001, Revision 01

Rev.	Date	By	Checked	Revision Notes
00	29/09/19	PR	IR	Initial release of information
01	21/10/19	PR	-	Alternative manufacturers added

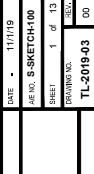
Lighting Equipment Specification/  
Mock-up

Project:	Coronado Bridge, San Diego, USA
Project Number:	10000
Document Number:	10000-LP-001
Revision:	00

Contents

INTRODUCTION  
SPECIFICATION OF LIGHTING EQUIPMENT  
NOTES

PAGE 2  
PAGE 3  
PAGE 10



SAN DIEGO UNIFIED PORT DISTRICT

CORONADO BRIDGE ART LIGHTING  
MOCK UP SCOPE

Lighting Equipment Specification

DESIGNED Sperin+Major	APPROVAL RECOMMENDED
DRAWN Sperin+Major	PROJECT MANAGER
CHECKED Sperin+Major	APPROVED
CHECKED Sperin+Major	OVERSEEN/CONTROLLED BY (DO NOT SIGN IF NOT AVAILABLE)

DATE	11/1/19
SHEET	1 of 13
DRAWING NO.	TL-2019-03

RECORD DRAWING
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NOTE	THIS DRAWING MAY BE A REDUCED SCALE DRAWING. VERIFY THE GRAPHIC SCALES TO VERIFY THE DRAWING IS A REDUCED SCALE DRAWING. REDUCED SCALE DRAWING IS NOT TO BE USED FOR CONSTRUCTION. VERIFY THE GRAPHIC SCALES SHOWN.
REFERENCE	SPEC. NO. - 2019-03
PROJECT NUMBER	10000
CONTRACTOR	CONTRACTOR
CONSTRUCTION COMPLETED	CONSTRUCTION COMPLETED
DATE	DATE

REVISIONS
DATE / APPROVAL

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1.0 Introduction

This lighting equipment specification describes the luminaires, light sources, and accessories required to deliver the lighting scheme designed by Speirs + Major as intended.

This specification should be read in conjunction with lighting layouts, lighting details, lighting control system specification, logical control channel schedule and other relevant documentation by Speirs + Major.

A detailed equipment list has been provided for the signify equipment - (2) two alternate manufacturers have also been included: Lumenpulse and GVA Lighting, but all and any proposed substitutions to the equipment specified shall be equal to that detailed in this document in performance and quality. The contractor or supplier shall be required to submit to the lighting consultant a working sample of the luminaire proposed, together with full photometric and dimensional data, to enable both its accurate assessment for approval and the detailing of any adjustments deemed necessary. In proposing substitutions, attention should be paid to the notes section at the end of this document as well as to the details of the product specified.

This report defines the proposal of installation a full-scale lighting mock-up of the Coronado Bridge on four structural piers located over water to demonstrate the lit effect proposed for bridge to relevant stake holders.

1.1 Lighting Mock-up

The lighting mock-up requires the installation of the lighting equipment to piers 15, 16, 17 and 18 over water. Lighting equipment will be located at high level at the tops of all piers and at low level on pier 18 (gateway pier).

The mock-up will demonstrate the artistic effect proposed through a number of dynamic color-way sequences programmed by artist Peter Fink.

The lighting mock-up will be installed and operate after-dark for a maximum of six nights. The first two nights will allow for final set-up, testing and programming to meet the artist's requirements. The second two nights will be operational to allow for VIP tours and the final two nights will allow for public viewings and boat tours.

The following elements will be illuminated during the engineering lighting test:

- a. High level linear graze to side (long) elevation of piers 15, 16, 17 + 18.
- b. High level projectors to pier legs of side (long) elevation 15, 16, 17 + 18.
- c. High level beacon to demarcate leading edge of piers 15, 16, 17 + 18.
- d. Low level uplighting to leading elevation of pier 18.
- e. Low level uplighting to inner elevation of pier 18.
- f. Low level linear graze to dolphin of pier 18.

1.2 Lighting Control Requirements

Due to distances involved for the installation and control of the lighting equipment for the mock-up, all high-level lighting equipment on piers 15, 16, 17 and 18 will be control wirelessly and will require wireless receivers suitable located to allow control of the luminaires.

The lighting control system and wireless transmitter will be located at the base of pier 18, where the luminaires will be controlled by wiring. Pre and on-site field support will be required to ensure that all equipment is fully commissioned, tested and programmed to meet the requirement of the artist - refer to 10000-CN-001 for further details.

Coronado Bridge  
San Diego, USA

Mock-up  
10000-LP-001, Revision 00

Linear Graze to Piers

Luminaire Ref. XA

Description:

Exterior quality, UL Wet Location, IP66 and IK10 rated surface mounted linear colour change LED luminaire, with 9° x 9° collimated optical lenses for narrow beam optical distribution. Utilizing 120V 74W RGBW (4000K) linear LED array (48no) with a delivered light output of 2620 lumens when all LEDs are operational.  
Extruded anodized aluminum housing with clear UV-protected polycarbonate lens, integral male/female waterproof connectors and multi-positional, constant torque locking hinges. Anodized finish and supplied with integral DMX LED driver.  
Luminaires to be supplied with necessary leader and jumper cables as required.

Luminaire:

IP Rating: UL Wet Location, IP66 + IK10  
Optical distribution: 9° x 9°  
Mounting: Surface mounted  
Finish: Anodized  
Circuit/System Wattage:(W) 74 W  
Lumen Output: (lm) 2620 lm  
(delivered lumens)  
Luminaire Efficacy: (lm/W) 36.3 lm/W  
(luminaire lumens/circuit Watt)

Accessories:

Masking Shield, 48"  
UL Leader Cable  
UL Jumper Cables as required

Accessory Ordering Information:

Catalogue Number 120-000203-03  
108-000055-0x  
108-000057-0x

Light Source:

Type: LED  
Wattage: 74 W  
Colour Temperature: RGB + White ~4000K  
Colour Rendering: n/a  
Base: Integral LED  
Lamp Lumens: (lm) n/a  
Efficacy: (lm/W) n/a  
Rated Life: >100,000 hrs (L70B10)  
Colour Consistency: n/a

Light Source Ordering Information:

Manufacturer: -  
Reference: Integral LED  
Qty. per luminaire: 48  
Notes: -

Special Requirements:

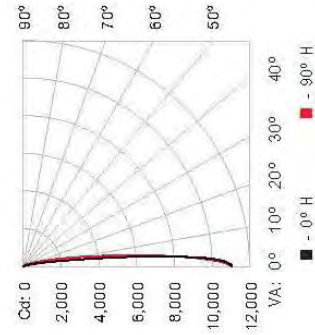
To be supplied compliant with ANSI C136.31, 3G, Vibration Standard for Bridge Applications and ASTM B117 Corrosion Resistance standard.

Driver/ Ballast:

Driver/Ballast type: Integral  
IP Rating: n/a  
Elec. Input: 120VAC  
Output: n/a

Driver Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires per driver: n/a  
Notes: -



Important Notes:

All wiring, containment, etc. to electrical contractor's drawings, details and specification.  
All associated fixings, mounting and bracketry to contractor's drawings, details and specification.

DC Power Supply: (if required)

IP Rating: -  
Elec. Input: -  
Output Voltage: -  
Maximum Current/Load: -  
Size: -  
Weight: -

DC Power Supply Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires/drivers per DC power supply: -  
Notes: -

Refer to drawings + documents:

10000-LA-001  
10000-LA-002

Physical Characteristics:

Dimensions 48" x 2.8" x 2.7"  
Cut Out: n/a  
Recess: n/a  
Bezel: n/a  
Weight: 9.3 lb

Driver + DC Power Supply Notes:

n/a

Manufacturer/Supplier Information:

Manufacturer/Supplier: Color Kinetics/Signify  
Telephone: -  
Email: -  
Contact: Ian Rubin  
Contact Telephone: +1(1) 702-859-2812  
Contact Email: ian.rubin@signify.com

Lighting Equipment Specification

www.speirsandmajor.com



Coronado Bridge  
San Diego, USA

Mock-up  
10000-LP-001, Revision 00

Graze to Pier Legs

Luminaire Ref. XB

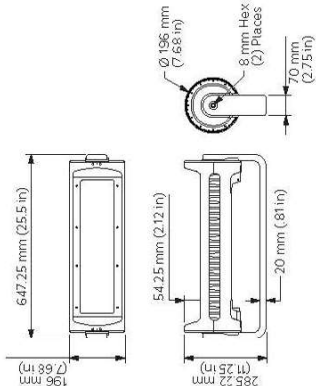
**Description:**  
Exterior quality, UL Wet Location, IP66 and IK09 rated stirrup mounted colour change LED projector, with 5° collimated optical lenses for narrow beam optical distribution. Utilizing 120V 100W RGBW (4000K) LED array (36no) with a delivered light output of 3251 lumens when all LEDs are operational.  
Die cast aluminium housing with clear tempered glass lens, integral male/female waterproof connector and standard black power coated finish and supplied with integral DMX LED driver.

**Luminaire:**  
IP Rating: UL Wet Location, IP66 + IK09  
Optical distribution: 5°  
Mounting: Stirrup mounted  
Finish: Standard black  
Circuit/System Wattage:(W) 100 W  
Lumen Output: (lm) 3251 lm  
(delivered lumens)  
Luminaire Efficacy: (lm/W) 33 lm/W  
(luminaire lumens/circuit Watt)

**Luminaire Ordering Information:**  
Manufacturer: Color Kinetics  
Product: ReachElite iColor 100 Powercore RGBW 5° Spread Lens  
Catalogue Number: 423-000103-00  
Ordering Notes: To be supplied to meet ANSI C136.31, 3G & ASTM B117 and accessories listed below.  
Any alternative product must be Equal & Approved by Design Team

**Accessories:**  
Half Glare Shield, Black  
UL 4 Conductor Lead Cable

**Accessory Ordering Information:**  
Catalogue Number 120-000197-01  
108-000055-0x



**Special Requirements:**  
To be supplied compliant with ANSI C136.31, 3G, Vibration Standard for Bridge Applications and ASTM B117 Corrosion Resistance standard.

**Driver/ Ballast:**  
Driver/Ballast type: Integral  
IP Rating: n/a  
Elec. Input: 120VAC  
Output: n/a

**Driver Ordering Information:**  
Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires per driver: n/a  
Notes: -

Maximum Current/Load  
Dimming Range: 100% - 0%  
Control Protocol: DMX  
Size: (if remote)  
Weight: (if remote)

Notes: -

Important Notes:

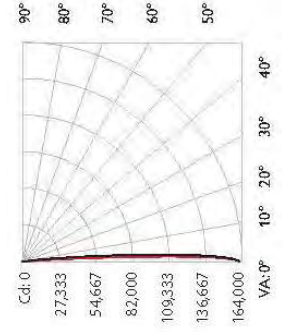
All wiring, containment, etc. to electrical contractor's drawings, details and specification.  
All associated fixings, mounting and bracketry to contractor's drawings, details and specification.

DC Power Supply: (if required)

IP Rating: -  
Elec. Input: -  
Output Voltage: -  
Maximum Current/Load: -  
Size: -  
Weight: -

DC Power Supply Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires/drivers per DC power supply: -  
Notes: -



Physical Characteristics:

Dimensions 25.7" x 11.25" x 7.68"  
Cut Out: n/a  
Recess: n/a  
Bezel: n/a  
Weight: 32 lb

Refer to drawings + documents:

10000-LA-001  
10000-LA-002

Driver + DC Power Supply Notes:

n/a

Manufacturer/Supplier Information:

Manufacturer/Supplier: Color Kinetics/Signify  
Telephone: -  
Email: -  
Contact: Ian Rubin  
Contact Telephone: +1 702-859-2812  
Contact Email: ian.rubin@signify.com

Lighting Equipment Specification

www.specsandmajor.com

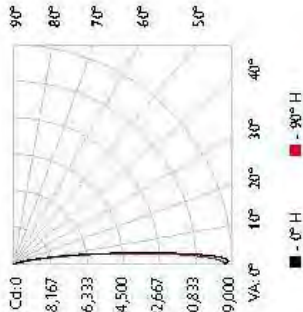
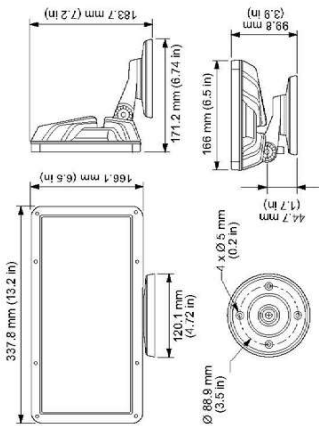
Coronado Bridge  
San Diego, USA

Mock-up  
10000-LP-001, Revision 00

Uplight to Gateway Piers - Leading Edge

Description:

Exterior quality, UL Wet Location, IP66 and IK10 rated bracket mounted colour change LED projector, with 10° collimated optical lenses for narrow beam optical distribution. Utilizing 120V 50W RGBW (4000K) LED array (36no) with a delivered light output of 2161 lumens when all LEDs are operational.  
Die cast aluminium housing with clear tempered glass lens, 6ft unified power/data cable and standard black powder coated finish and supplied with integral DMX LED driver.



**Physical Characteristics:**  
Dimensions 13.3" x 7.2" x 6.75"  
Cut Out: n/a  
Recess: n/a  
Bezel: n/a  
Weight: 8.2 lb

**Refer to drawings + documents:**  
10000-LA-001

**Special Requirements:**  
To be supplied compliant with ANSI C136.31, 3G, Vibration Standard for Bridge Applications and ASTM B117 Corrosion Resistance standard.

Important Notes:

All wiring, containment, etc. to electrical contractor's drawings, details and specification.  
All associated fixings, mounting and bracketry to contractor's drawings, details and specification.

**Luminaire:**  
IP Rating: UL Wet Location, IP66 + IK10  
Optical distribution: 10°  
Mounting: Bracket mounted  
Finish: Standard black  
Circuit/System Wattage:(W) 50 W  
Lumen Output: (lm) 2161 lm  
(delivered lumens)  
Luminaire Efficacy: (lm/W) 44.9 lm/W  
(Luminaire lumens/circuit Watt)

Accessories:

Half Glare Shield, Black

Light Source:

Type: LED  
Wattage: n/a  
Colour Temperature: RGB + White (4000K)  
Colour Rendering: n/a  
Base: Integral LED  
Lamp Lumens: (lm) n/a  
Efficacy: (lm/W) n/a  
Rated Life: 50,000 hrs (L70B10)  
Colour Consistency: n/a

Driver/ Ballast:

Driver/Ballast type: Integral  
IP Rating: n/a  
Elec. Input: 120VAC  
Output: n/a

Maximum Current/Load -  
Dimming Range: 100% - 0%  
Control Protocol: DMX  
Size: (if remote) -  
Weight: (if remote) -

DC Power Supply: (if required)

IP Rating: -  
Elec. Input: -  
Output Voltage: -  
Maximum Current/Load: -  
Size: -  
Weight: -

**Driver + DC Power Supply Notes:**  
n/a

Luminaire Ref. XC

Luminaire Ordering Information:

Manufacturer: Color Kinetics  
Product: ColorBlast Powercore gen4  
Catalogue Number: RGBW 10° 423-000012-01  
Ordering Notes: To be supplied to meet ANSI C136.31, 3G & ASTM B117 and accessories listed below.  
Any alternative product must be Equal & Approved by Design Team

Accessory Ordering Information:

Catalogue Number 120-000185-14

Light Source Ordering Information:

Manufacturer: -  
Reference: Integral LED  
Qty. per luminaire: 36  
Notes: -

Driver Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires per driver: n/a  
Notes: -

DC Power Supply Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires/drivers per DC power supply: -  
Notes: -

Manufacturer/Supplier Information:

Manufacturer/Supplier: Color Kinetics/Signify  
Telephone: n/a  
Email: n/a  
Contact: Ian Rubin  
Contact Telephone: +1(1) 702-859-2812  
Contact Email: ian.rubin@signify.com

Lighting Equipment Specification

www.speirsandmajor.com

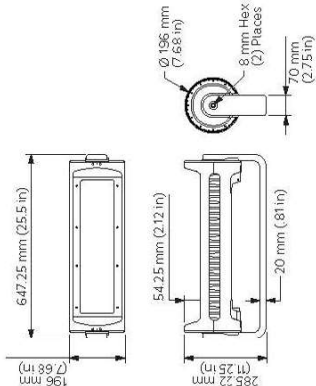
Coronado Bridge  
San Diego, USA

Mock-up  
10000-LP-001, Revision 00

## Uplight to Gateway Piers - Inner Edge

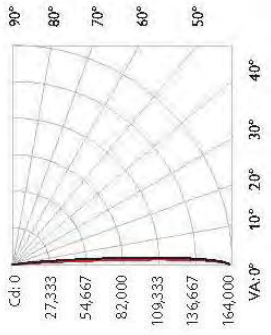
### Description:

Exterior quality, UL Wet Location, IP66 and IK09 rated stirrup mounted colour change LED projector, with 5° collimated optical lenses for narrow beam optical distribution. Utilizing 120V 100W RGBW (4000K) LED array (36no) with a delivered light output of 3251 lumens when all LEDs are operational.  
Die cast aluminium housing with clear tempered glass lens, integral male/female waterproof connector and Standard black power coated finish and supplied with integral DMX LED driver.



### Special Requirements:

To be supplied compliant with ANSI C136.31, 3G, Vibration Standard for Bridge Applications and ASTM B117 Corrosion Resistance standard.



### Physical Characteristics:

Dimensions: 25.7" x 11.25" x 7.68"  
Cut Out: n/a  
Recess: n/a  
Bezel: n/a  
Weight: 32 lb

### Refer to drawings + documents:

10000-LA-001  
10000-LA-002

### Luminaire:

IP Rating: UL Wet Location, IP66 + IK09  
Optical distribution: 5°  
Mounting: Surface mounted  
Finish: Standard black  
Circuit/System Wattage(W): 100 W  
Lumen Output: (lm) 3251 lm  
(delivered lumens)  
Luminaire Efficacy: (lm/W) 33 lm/W  
(luminaire lumens/circuit Watt)

### Accessories:

Half Glare Shield, Black  
UL 4 Conductor Lead Cable

## Luminaire Ref. XD

### Luminaire Ordering Information:

Manufacturer: Color Kinetics  
Product: ReachElite iColor 100 Powercore  
Catalogue Number: RGBW 5° Spread Lens  
423-000103-00  
Ordering Notes: To be supplied to meet ANSI C136.31, 3G & ASTM B117 and accessories listed below.  
Any alternative product must be Equal & Approved by Design Team

### Accessory Ordering Information:

Catalogue Number: 120-000197-01  
108-000055-0x

### Light Source Ordering Information:

Manufacturer: -  
Reference: Integral LED  
Qty. per luminaire: 36  
Notes: -

### Driver Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires per driver: n/a  
Notes: -

### DC Power Supply Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires/drivers per DC power supply: -  
Notes: -

### Driver + DC Power Supply Notes:

n/a

### Manufacturer/Supplier Information:

Manufacturer/Supplier: Color Kinetics/Signify  
Telephone: n/a  
Email: n/a  
Contact: Ian Rubin  
Contact Telephone: +1 702-859-2812  
Contact Email: ian.rubin@signify.com

### Lighting Equipment Specification

www.speirsandmajor.com

Coronado Bridge  
San Diego, USA

Mock-up  
10000-LP-001, Revision 00

Beacon - Leading Edge

Luminaire Ref. XE

Description:

Exterior quality, UL Wet Location, IP66 and IK10 rated bracket mounted colour change LED projector, with 10° collimated optical lenses for narrow beam optical distribution. Utilizing 120V 50W RGBW (4000K) LED array (36no) with a delivered light output of 2161 lumens when all LEDs are operational.  
Die cast aluminium housing with clear tempered glass lens, 6ft unified power/data cable and standard black power coated finish and supplied with integral DMX LED driver.

Luminaire:

IP Rating: UL Wet Location, IP66 + IK10  
Optical distribution: 10° + 80° Spread lens  
Mounting: Surface mounted  
Finish: Standard  
Circuit/System Wattage:(W) 50 W  
Lumen Output: (lm) 1772 lm  
(delivered lumens)  
Luminaire Efficacy: (lm/W) 34.5 lm/W  
(Luminaire lumens/circuit Watt)

Luminaire Ordering Information:  
Manufacturer: Color Kinetics  
Product: ColorBlast Powercore gen4  
RGBW  
Catalogue Number: 423-000012-01

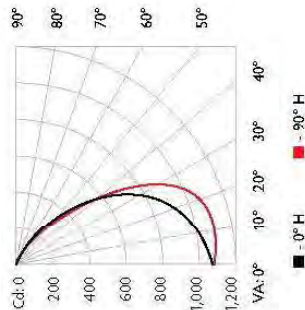
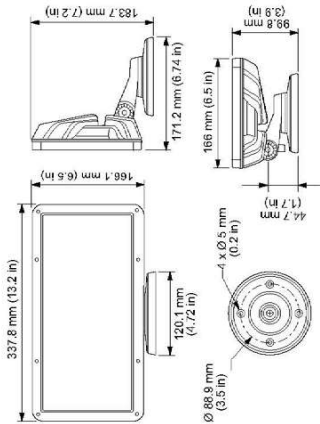
Ordering Notes:  
To be supplied to meet ANSI C136.31, 3G & ASTM B117 and accessories listed below.  
Any alternative product must be Equal & Approved by Design Team

Accessories:

80° Spread Lens  
Trim Ring, Black

Accessory Ordering Information:

Catalogue Number 120-000185-11  
120-000185-01



Special Requirements:

To be supplied compliant with ANSI C136.31, 3G, Vibration Standard for Bridge Applications and ASTM B117 Corrosion Resistance standard.

Important Notes:

All wiring, containment, etc. to electrical contractor's drawings, details and specification.  
All associated fixings, mounting and bracketry to contractor's drawings, details and specification.

Physical Characteristics:

Dimensions 13.3" x 7.2" x 6.75"  
Cut Out: n/a  
Recess: n/a  
Bezel: n/a  
Weight: 8.2 lb

Refer to drawings + documents:

10000-LA-001  
10000-LA-002

Light Source:

Type: LED  
Wattage: n/a  
Colour Temperature: RGB + White (4000K)  
Colour Rendering: n/a  
Base: Integral LED  
Lamp Lumens: (lm) n/a  
Efficacy: (lm/W) n/a  
Rated Life: 50,000 hrs (L70B10)  
Colour Consistency: n/a

Driver/ Ballast:

Driver/Ballast type: Integral  
IP Rating: n/a  
Elec. Input: 120VAC  
Output: n/a

Light Source Ordering Information:

Manufacturer: -  
Reference: Integral LED  
Qty. per luminaire: 36  
Notes: -

Driver Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires per driver: n/a  
Notes: -

DC Power Supply: (if required)

IP Rating: -  
Elec. Input: -  
Output Voltage: -  
Maximum Current/Load: -  
Size: -  
Weight: -

DC Power Supply Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires/drivers per DC power supply: -  
Notes: -

Driver + DC Power Supply Notes:

n/a

Manufacturer/Supplier Information:

Manufacturer/Supplier: Color Kinetics/Signify  
Telephone: n/a  
Email: n/a  
Contact: Ian Rubin  
Contact Telephone: +1(1) 702-859-2812  
Contact Email: ian.rubin@signify.com

Lighting Equipment Specification

www.speirsandmajor.com



Coronado Bridge  
San Diego, USA

Mock-up  
10000-LP-001, Revision 00

Linear Graze to Dolphin

Luminaire Ref. XF

Description:

Exterior quality UL Wet Location, IP66 and IK10 rated surface mounted linear colour change LED luminaire, with 9° x 9° collimated optical lenses for narrow beam optical distribution. Utilizing 120V 74W RGBW (4000K) linear LED array (48no) with a delivered light output of 2620 lumens when all LEDs are operational. Extruded anodized aluminum housing with clear UV-protected polycarbonate lens, integral male/female waterproof connectors and multi-positional, constant torque locking hinges. Anodized finish and supplied with integral DMX LED driver. Luminaires to be supplied with necessary leader and jumper cables as required.

Luminaire:

IP Rating: UL Wet Location, IP66 + IK10  
Optical distribution: 9° x 9  
Mounting: Surface mounted  
Finish: Anodized  
Circuit/System Wattage:(W) 74 W  
Lumen Output: (lm) 2620 lm  
(delivered lumens)  
Luminaire Efficacy: (lm/W) 36.3 lm/W  
(luminaire lumens/circuit Watt)

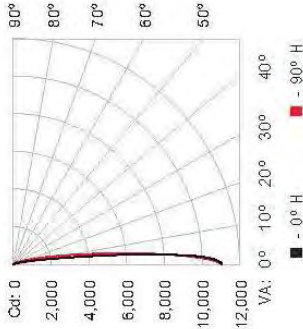
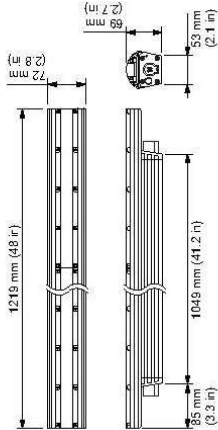
Accessories:

Masking Shield, 48"  
UL Leader Cable  
UL Jumper Cables as required

Accessory Ordering Information:

Catalogue Number 120-000203-03  
108-000055-0x  
108-000057-0x

Ordering Notes:  
To be supplied to meet ANSI C136.31, 3G & ASTM B117 and accessories listed below.  
Any alternative product must be Equal & Approved by Design Team



Refer to drawings + documents:

10000-LA-001

Physical Characteristics:

Dimensions 48" x 2.8" x 2.7"  
Cut Out: n/a  
Recess: n/a  
Bezel: n/a  
Weight: 9.3 lb

Light Source:

Type: LED  
Wattage: 74 W  
Colour Temperature: RGB + White ~4000K  
Colour Rendering: n/a  
Base: Integral LED  
Lamp Lumens: (lm) n/a  
Efficacy: (lm/W) n/a  
Rated Life: >100,000 hrs (L70B10)  
Colour Consistency: n/a

Special Requirements:

To be supplied compliant with ANSI C136.31, 3G, Vibration Standard for Bridge Applications and ASTM B117 Corrosion Resistance standard.

Driver/ Ballast:

Driver/Ballast type: Integral  
IP Rating: n/a  
Elec. Input: 120VAC  
Output: n/a

Driver Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires per driver: n/a

Light Source Ordering Information:

Manufacturer: -  
Reference: Integral LED  
Qty. per luminaire: 48  
Notes: -

Maximum Current/Load

Dimming Range: 100% - 0%  
Control Protocol: DMX  
Size: (if remote) -  
Weight: (if remote) -

DC Power Supply: (if required)

IP Rating: -  
Elec. Input: -  
Output Voltage: -  
Maximum Current/Load: -  
Size: -  
Weight: -

DC Power Supply Ordering Information:

Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires/drivers per DC power supply: -  
Notes: -

Driver + DC Power Supply Notes:

n/a

Manufacturer/Supplier Information:

Manufacturer/Supplier: Color Kinetics/Signify  
Telephone: -  
Email: n/a  
Contact: Ian Rubin  
Contact Telephone: +1(1) 702-859-2812  
Contact Email: ian.rubin@signify.com

Lighting Equipment Specification

www.speirsandmajor.com

Coronado Bridge  
San Diego, USA

Mock-up  
10000-LP-001, Revision 00

Linear Graze to Dolphin

Luminaire Ref. XF1

**Description:**  
Exterior quality UL Wet Location, IP66 and IK10 rated surface mounted linear colour change LED luminaire, with 9° x 9° collimated optical lenses for narrow beam optical distribution. Utilizing 120V 18.5W RGBW (4000K) linear LED array (12no) with a delivered light output of 655 lumens when all LEDs are operational.  
Extruded anodized aluminum housing with clear UV-protected polycarbonate lens, integral male/female waterproof connectors and multi-positional, constant torque locking hinges. Anodized finish and supplied with integral DMX LED driver.  
Luminaires to be supplied with necessary leader and jumper cables as required.

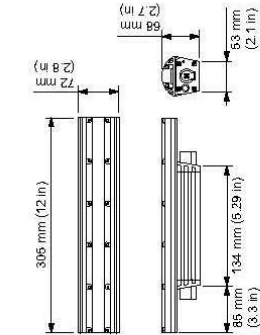
**Luminaire:**  
IP Rating: UL Wet Location, IP66 + IK10  
Optical distribution: 9° x 9°  
Mounting: Surface mounted  
Finish: Anodized  
Circuit/System Wattage:(W) 18.5 W  
Lumen Output: (lm) 655 lm  
Luminaire Efficacy: (lm/W) 36.3 lm/W  
(delivered lumens/circuit Watt)

**Luminaire Ordering Information:**  
Manufacturer: Color Kinetics  
Product: ColorGraze MX4 Powercore  
Catalogue Number: 423-000001-00

**Ordering Notes:**  
To be supplied to meet ANSI C136.31, 3G & ASTM B117 and accessories listed below.  
Any alternative product must be Equal & Approved by Design Team

**Accessories:**  
Masking Shield, 12"  
UL Jumper Cables as required

**Accessory Ordering Information:**  
Catalogue Number 120-000203-00  
108-000057-0x



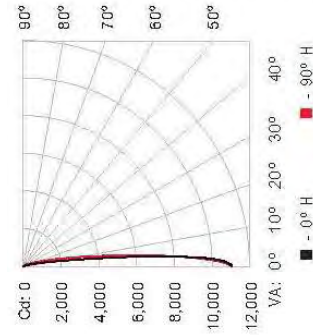
**Special Requirements:**  
To be supplied compliant with ANSI C136.31, 3G, Vibration Standard for Bridge Applications and ASTM B117 Corrosion Resistance standard.

**Light Source:**  
Type: LED  
Wattage: 18.5 W  
Colour Temperature: RGB + White ~4000K  
Colour Rendering: n/a  
Base: Integral LED  
Lamp Lumens: (lm) n/a  
Efficacy: (lm/W) n/a  
Rated Life: >50,000 hrs (L70B10)  
Colour Consistency: n/a

**Light Source Ordering Information:**  
Manufacturer: -  
Reference: Integral LED  
Qty. per luminaire: 12  
Notes: -

**Driver/ Ballast:**  
Driver/Ballast type: Integral  
IP Rating: n/a  
Elec. Input: 120VAC  
Output: n/a

**Driver Ordering Information:**  
Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires per driver: n/a  
Notes: -



**Important Notes:**  
All wiring, containment, etc. to electrical contractor's drawings, details and specification.  
All associated fixings, mounting and bracketry to contractor's drawings, details and specification.

**DC Power Supply: (if required)**  
IP Rating: -  
Elec. Input: -  
Output Voltage: -  
Maximum Current/Load: -  
Size: -  
Weight: -

**DC Power Supply Ordering Information:**  
Manufacturer: -  
Catalogue Number: n/a  
Max. quantity of luminaires/drivers per DC power supply: -  
Notes: -

**Refer to drawings + documents:**  
10000-LA-001

**Physical Characteristics:**  
Dimensions 12" x 2.8" x 2.7"  
Cut Out: n/a  
Recess: n/a  
Bezel: n/a  
Weight: 2.1 lb

**Driver + DC Power Supply Notes:**  
n/a

**Manufacturer/Supplier Information:**  
Manufacturer/Supplier: Color Kinetics/Signify  
Telephone: n/a  
Email: n/a  
Contact: Ian Rubin  
Contact Telephone: +1(1) 702-859-2812  
Contact Email: ian.rubin@signify.com

**Lighting Equipment Specification**  
www.speirsandmajor.com

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<b>1.0 General Requirements</b>	
1.1	Electrical
Electrical supply on site is presumed to be 120VAC, 60Hz, single phase and/or 480VAC three phase. All equipment should be compatible with this supply.	
Luminaires should exhibit no perceivable change in light output with a variation of plus/minus 10 percent supply voltage.	
Total Harmonic Distortion due to any lighting equipment shall be less than 20% and meet ANSI C82.11 maximum allowable THD requirements at full output.	
1.2	Physical
1.2.1	Materials and Finishes
Where galvanically incompatible metals are used in the construction of a luminaire, design must eliminate galvanic corrosion, through separation and/or insulation.	
Paints and powder coat finishes should be appropriate for the luminaire's proposed location. Exterior equipment should employ finishes which are stable to UV light, windborne particles and other environmental factors. Where specified as "Marine Grade", finishes must also be resilient to prolonged exposure to salt water spray.	
"Marine Grade", in the context of stainless steel, refers to SAE316 specification.	
Any gaskets should be made of materials which do not out-gas chemicals which can degrade the LED dies or phosphors.	
1.2.2	Ingress Protection
IP Ratings stated in this specification refer to IEC standard 60529. Where IP68 is specified (continuous immersion), test conditions are assumed to be 3m depth in fresh water, unless otherwise specified.	
1.2.3	Fixing
Clamp or spring assemblies for recessing downlights must be designed so as to be installable and removable without damaging plasterboard soffits.	
Removable front-plates, reflectors, trim rings, etc should be physically retained to the luminaire body by means of a wire or chain safety bond.	
<b>2.0 Light Sources</b>	
2.1	LEDs/LED Modules
The importance of colour consistency between luminaires and over time is critical to the success of the lighting scheme. The light produced by LEDs described as the same correlated colour temperature should produce light that is indiscernible in appearance from other LEDs of the same CCT. It is the responsibility of the party producing the final specification to compare samples of the specified luminaires to ensure this consistency across the project.	
The benchmark for acceptable colour consistency between luminaires of the same type shall be 4 MacAdam ellipse (Standard Deviation Colour Matching) for road lighting and 2 MacAdam ellipses for all other lighting including, but not limited to, downlights, wall washers, spotlights. Linear luminaires and decorative fittings. The consistency requirements for each specified type is indicated in this specification.	
Colour of LED light sources should not exhibit greater change than three SDCM steps after five years.	
2.1.2	Colour Rendering
Colour rendering ability of luminaires and lamps is expressed in this specification using CIE Ra (Colour Rendering Index), assumed to be based on samples R1 to R8. Where relevant, minimum values for samples R9 and above may be given.	
Unless specifically stated, a Colour Rendering Index of less than 80 will not be acceptable for any light source.	
Note	
Luminous flux, colour (chromaticity, CCT, CRI) and intensity distribution shall be measured and stated in compliance with IESNA LM79-08.	
2.1.3	Lifetime
The lifetime of LEDs shall be stated in terms of L70F10, unless explicitly stated otherwise within this specification. Measurement shall be in accordance with IESNA LM80-08, with extrapolated data in accordance with IESNA TM21-11. Unless otherwise stated, data should relate to an ambient temperature of 25°C for interior luminaires and 15°C for exterior luminaires.	

2.1.4 Thermal Management

Luminaire manufacturers shall ensure that sufficient thermal management is provided within the luminaire to maintain the junction temperature of LEDs at or below the LED manufacturer's recommendations. Heat rejection should be by means of heatsink, convective heatpipes and similar passive means. Active cooling by means of fan or oscillating diaphragm will not be acceptable unless explicitly identified in the specification.

2.2 LED Lamps

2.2.1 Colour Consistency

The importance of colour consistency between luminaires and over time is critical to the success of the lighting scheme. The light produced by LED lamps described as the same correlated colour temperature should produce light that is indiscernible in appearance from other LED lamps of the same CCT. It is the responsibility of the party producing the final specification to compare samples of the specified lamps to ensure this consistency across the project.

The benchmark for acceptable colour consistency between lamps of the same type shall be 3 MacAdam (SDCM) unless otherwise indicated in this specification.

Colour of LED lamps should not exhibit greater change than three SDCM steps after five years.

2.2.2 Colour Rendering

Colour rendering properties of luminaires and lamps is expressed in this specification using CIE Ra (Colour Rendering Index), assumed to be based on samples R1 to R8. Where relevant, minimum values for samples R9 and above may be given. Unless specifically stated, a Colour Rendering Index of less than 80 will not be acceptable for any LED lamp.

*Note*  
Luminous flux, colour (chromaticity, CCT, CRI) and intensity distribution shall be measured and stated in compliance with IESNA LM79.

2.2.3 Lifetime

The lifetime of LED lamps shall be stated in terms of L70F50, unless explicitly stated otherwise within this specification. Measurement shall be in accordance with IESNA LM80-08, with extrapolated data in accordance with IESNA TM21.

2.2.4 Electrical

LED replacement lamps shall use the same supply voltage as the traditional lamps they replace – typically 12V AC or 230V AC. Such lamps must have a power factor of not less than 0.9.

2.2.5 Thermal Management

Lamp manufacturers shall ensure that sufficient thermal management is provided within the lamp to maintain the junction temperature of LEDs at or below the LED chip manufacturer's recommendations. Heat rejection should be by means of heatsink, convective heatpipes and similar passive means. Active cooling by means of fan or oscillating diaphragm will not be acceptable unless explicitly identified in the specification.

2.2.6 Dimming Compatibility

LED lamps which are dimmable by "mains dimming" shall be compatible with phase-cut leading-edge triac dimmers, trailing edge GBT (transistor) dimmers, and sinewave dimmers. Lamp manufacturers should provide sample lamps to the control system supplier so as to verify dimming compatibility.

2.2.7 Form Factors

LED replacement lamps should accurately follow the form factor of the traditional lamp which they are designed to replace, allowing for direct replacement in luminaires designed for conventional lamps without modification.

2.3 Conventional Lamps

Lamps are generally specified by example in terms of manufacturer's product name and catalogue number. Should alternative lamps be offered, particular attention must be paid to colour rendering, colour temperature, light distribution, life expectancy and general performance when selecting such alternatives. Alternative lamps may only be substituted if full technical data is first supplied to Speirs + Major to enable their accurate assessment and approval.

The efficiency of any conventional lamps must exceed the requirements of ongoing phase-out legislation applicable in the country where the project is located.

3.0 Control Gear

3.1 Constant Current LED Drivers

Constant current LED drivers shall deliver the designated current (at full output) +/-5%.

Drivers shall have an efficiency of at least 80% and power factor of at least 0.9.

Drivers which are dimmable via a control signal should have a parasitic load whilst in "off" state not exceeding 0.5W.

Drivers which are dimmable by "mains dimming" shall be compatible with phase-cut leading-edge triac dimmers, trailing edge GBT (transistor) dimmers, and sinewave dimmers. Luminaire manufacturers should provide sample luminaires containing final specification components to the control system supplier so as to verify dimming compatibility.

3.1.1 Control Protocols

LED drivers must be controllable by means of DALI, DMX or 0-10V/1-10V analogue, as specified item-by-item in this document. Relevant standards describing each protocol should be followed.

DALI devices must carry the DALI logo, indicating compliance testing with IEC 62386.

DMX devices must comply with USITT DMX512-A

DMX devices which are capable of direct connection to Ethernet in order to receive DMX data are specified item-by-item in this document as using Art-Net or Streaming ACN. Devices identified as being compatible with Art-Net must comply with Art-NET 3, 2011. Devices identified as being compatible with Streaming ACN must comply with ANSI E1.31 – 2009 Entertainment Technology – Lightweight streaming protocol for transport of DMX512 using ACN.

Devices specified as being compatible with 0-10V analogue control (where the device sinks current) must comply with *ESTA E1.3 - Entertainment Technology - Lighting Control System - 0 to 10V Analogue Control Protocol*. Devices specified as compatible with 1-10V analogue control (where the device sources current) must comply with IEC 60292 Annex E.2.

3.1.2 Dimming

The required dimming range of each luminaire type is specified item-by-item in this document. A minimum output figure is given, and should be read as the percentage of perceived output which the unit should be dimmable to before turning off. LED(s) and driver in combination must provide continuous step-free, flicker free dimming similar in perception to an incandescent source.

3.1.3 Flicker

Drivers and LEDs shall deliver illumination that is free from objectionable flicker as measured by flicker index (ANSI/IES RP-16-10). At all points within the dimming range from 100 percent to specified minimum, luminaires shall have flicker index less than 5% at all frequencies below 1000 Hz.

3.1.4 Electrical Protection

All drivers should be able to withstand up to a 1,000 volt surge without impairment of performance as defined by ANSI C62.47 Category A.

Drivers should have in-built protection against damage due to a short circuit or open circuit on the output, and should recover automatically after fault condition is removed.

Drivers must incorporate protection against overload on outputs, such that no damage is sustained to the driver itself, and should recover automatically after fault condition is removed.

3.1.5 Thermal Protection

All drivers should incorporate over-temperature protection, shutting down when required and recovering automatically once temperature falls back within operational range.

3.2 Constant Voltage LED drivers/power supplies

Constant voltage power supplies shall deliver the designated voltage with ripple of not more than 10% (P-P).

Power supplies shall have an efficiency of at least 80% and power factor of at least 0.9.



3.2.1 Control Protocols

LED drivers must be controllable by means of DALI, DMX or 0-10V/1-10V analogue, as specified item-by-item in this document. Relevant standards describing each protocol should be followed.

DALI devices must carry the DALI logo, indicating compliance testing with IEC 62386.

DMX devices must comply with USITT DMX512-A

DMX devices which are capable of direct connection to Ethernet in order to receive DMX data are specified item-by-item in this document as using Art-Net or Streaming ACN. Devices identified as being compatible with Art-Net must comply with *Art-NET 3, 2011*. Devices identified as being compatible with Streaming ACN must comply with *ANSI/E1.31 – 2009 Entertainment Technology – Lightweight streaming protocol for transport of DMX512 using ACN*.

Devices specified as being compatible with 0-10V analogue control (where the device sinks current) must comply with *ESTA E1.3 - Entertainment Technology - Lighting Control System - 0 to 10V Analog Control Protocol*. Devices specified as compatible with 1-10V analogue control (where the device sources current) must comply with *IEC 60292 Annex E.2*.

3.2.2 Dimming

Constant voltage LED modules are typically dimmed using a Pulse-Width-Modulation dimming controller between power supply and LED module. Such a dimmer should be integrated into the constant voltage power supply, or supplied by the same manufacturer.

Constant current drivers which are dimmable by "mains dimming" shall be compatible with phase-out leading-edge triac dimmers, trailing edge IGBT (transistor) dimmers, and sinewave dimmers. Luminaire manufacturers should provide sample luminaires containing final specification components to the control system supplier so as to verify dimming compatibility.

The required dimming range of each luminaire type is specified item-by-item in this document. A minimum output figure is given, and should be read as the percentage of perceived output which the unit should be dimmable to before turning off.

LED(s) and driver in combination must provide continuous step-free, flicker free dimming similar in perception to an incandescent source.

3.2.3 Flicker

Drivers and LEDs shall deliver illumination that is free from objectionable flicker as measured by flicker index (ANSI/IES RP-16-10). At all points within the dimming range from 100 percent to specified minimum, luminaires shall have flicker index less than 5% at all frequencies below 1000 Hz.

3.2.4 Electrical Protection

All drivers should be able to withstand up to a 1,000 volt surge without impairment of performance as defined by *ANSI C62.41 Category A*.

Drivers should have in-built protection against damage due to a short circuit or open circuit on the output, and should recover automatically after fault condition is removed.

Drivers must incorporate protection against overload on outputs, such that no damage is sustained to the driver itself, and should recover automatically after fault condition is removed.

3.2.5 Thermal Protection

All drivers should incorporate over-temperature protection, shutting down when required and recovering automatically once temperature falls back within operational range.

3.3 Ballasts and Transformers

Transformers shall be electronic and have a stable output voltage of 11.5V/23V, under varying loads, where the output voltage is nominally quoted at 12V/24V.

Ballasts for fluorescent lamps shall operate lamps at high frequency (>20kHz) and shall be instant start. Ballasts shall have a power factor of at least 0.9.

3.3.1 Control Protocols

Ballasts and transformers must be controllable by means of DALI, DMX or 0-10V/1-10V analogue, as specified item-by-item in this document. Relevant standards describing each protocol should be followed.

DALI devices must carry the DALI logo, indicating compliance testing with IEC 62386.

DMX devices must comply with USITT DMX512-A

DMX devices which are capable of direct connection to Ethernet in order to receive DMX data are specified item-by-item in this document as using Art-Net or Streaming ACN. Devices identified as being compatible with Art-Net must comply with *Art-NET 3, 2011*. Devices identified as being compatible with Streaming ACN must comply with *ANSI/E1.31 – 2009 Entertainment Technology – Lightweight streaming protocol for transport of DMX512 using ACN*.

Devices specified as being compatible with 0-10V analogue control (where the device sinks current) must comply with *ESTA E1.3 - Entertainment Technology - Lighting Control System - 0 to 10V Analog Control Protocol*. Devices specified as compatible with 1-10V analogue control (where the device sources current) must comply with *IEC 60292 Annex E.2*.

3.3.2 Dimming

Transformers driving low-voltage lamps shall be compatible with phase-out leading-edge triac dimmers, trailing edge IGBT (transistor) dimmers, and sinewave dimmers. Luminaire manufacturers should provide sample luminaires containing final specification components to the control system supplier so as to verify dimming compatibility.

Dimmable fluorescent ballasts shall be dimmed using control signals as specified above.

The required dimming range of each luminaire type is specified item-by-item in this document. A minimum output figure is given, and should be read as the percentage of perceived output which the unit should be dimmable to before turning off.

Lamps and ballasts/transformers in combination must provide continuous step-free, flicker free dimming similar in perception to incandescent source.

3.3.3 Flicker

Fluorescent lamps and ballasts shall deliver illumination that is free from objectionable flicker as measured by flicker index (ANSI/IES RP-16-10). At all points within the dimming range from 100 percent to specified minimum, luminaires shall have flicker index less than 5% at all frequencies below 1000 Hz.

3.3.4 Electrical Protection

All ballasts and transformers should be able to withstand up to a 1,000 volt surge without impairment of performance as defined by *ANSI C62.41 Category A*.

Drivers should have in-built protection against damage due to a short circuit or open circuit on the output, and should recover automatically after fault condition is removed.

Drivers must incorporate protection against overload on outputs, such that no damage is sustained to the driver itself, and should recover automatically after fault condition is removed.

3.3.5 Thermal Protection

All drivers should incorporate over-temperature protection, shutting down when required and recovering automatically once temperature falls back within operational range.

4.0 Cold cathode systems

Cold cathode systems shall operate at below 1000V and utilise electronic power supplies.

All cold cathode installation shall be carried out by specialist suppliers who shall provide comprehensive specifications and drawings of the proposed installation, showing lengths of tubes, power supply sizes and electrical loads, etc. The supplier shall be responsible for carrying out a site survey if required.

The specialist supplier shall liaise with the electrical contractor and electrical engineer for determination of power supply locations.

The supplier shall provide and install tubes, power supplies, high voltage cables and physical supports and fixings for tubes. The electrical contractor shall be responsible for providing mains voltage supplies to agreed power supply locations.

Cold cathode lamps shall have turned-back electrodes so as to allow end-to-end installation with no shadows.

Power supplies shall be capable of dimming by means of trailing edge phase-cut dimming, or by means of 1-10V, DALI or DMX control signal, as specified item-by-item in this document. Relevant standards describing each protocol should be followed.

- DALI devices must carry the DALI logo, indicating compliance testing with IEC 62386.
- DMX devices must comply with USITT DMX512-A.

- DMX devices which are capable of direct connection to Ethernet in order to receive DMX data are specified item-by-item in this document as using Art-Net or Streaming ACN. Devices identified as being compatible with Art-Net must comply with Art-NET 3, 2011. Devices identified as being compatible with Streaming ACN must comply with ANSI E1.31—2009 Entertainment Technology—Lightweight streaming protocol for transport of DMX512 using ACN.

- Devices specified as being compatible with 0-10V analogue control must comply with *ESTA E1.3 - Entertainment Technology - Lighting Control System - 0 to 10V Analog Control Protocol*. Devices specified as compatible with 1-10V analogue control must comply with IEC 60292 Annex E.2.

4.1 Dimming

Cold cathode lamps and power supplies in combination must provide continuous step-free, flicker free dimming similar in perception to incandescent source. The dimming range should be from full output to 0% output.

4.2 Flicker

Cold cathode lamps and power supplies in combination shall deliver illumination that is free from objectionable flicker as measured by flicker index (ANSI/IES RP-16-10). At all points within the dimming range from 100 percent to specified minimum, luminaires shall have flicker index less than 5% at all frequencies below 1000 Hz.

4.3 Electrical Protection

All cold cathode power supplies should be able to withstand up to a 1,000 volt surge without impairment of performance as defined by ANSI C62.41 Category A.

Power supplies should have in-built protection against damage due to a short circuit or open circuit on the output, and should recover automatically after fault condition is removed.

Power supplies must incorporate protection against overload on outputs, such that no damage is sustained to the power supply itself, and should recover automatically after fault condition is removed.

4.4 Thermal Protection

All drivers should incorporate over-temperature protection, shutting down when required and recovering automatically once temperature falls back within operational range.

5.0 Optical Assemblies

Metal reflectors shall be of high-purity aluminium, bright anodised, or other finish if specified on item-by-item basis in this document.

Plastic reflectors shall be of polycarbonate with high-reflectance aluminium-look coating.

Lenses shall be of glass, PMMA, or polycarbonate and shall be optically colour-neutral, imparting no tint to the light.

6.0 Samples, Prototypes and Mock-ups

Should a sample of a standard product, or prototype of a special luminaire or variant of a standard luminaire be ordered, its cost shall either be incorporated into a tender price, or shall be invoiced to the client or his nominated representative separately, as agreed.

Any such sample prototype or variant shall be a sample of the luminaire type specified, and shall be submitted to the lighting consultant, together with full photometric and dimensional data if specifically requested, to enable both its accurate assessment and the detailing of any adjustments deemed necessary prior to the commencement of full production.

Prototypes are required of a series of luminaires where noted in the lighting equipment specification.

Where in-situ mock-ups are required to demonstrate the desired lit effect, this will be noted lighting equipment specification and in line with the architectural specification.

7.0 Packaging and Protection

All equipment shall be supplied with adequate means of protection to ensure its preservation during transport to site and any subsequent storage prior to installation. All vulnerable finished parts liable to scratching or other abrasion during handling and installation shall be further protected by a removable film applied prior to dispatch.

8.0 Manufacturers' Warranties

All equipment and components supplied shall be guaranteed against failure due to poor workmanship, materials, or luminaire design, for a period of not less than 5 years from the date of delivery to site, with the exception of lamps which shall be covered only by their manufacturer's normal assurances as to life expectancy and performance.

9.0 Standards

Lighting equipment should comply, where relevant, with the following standards and/or local versions to be agreed.

BS EN 62717 LED modules for general lighting. Performance requirements

BS EN 62031 LED modules for general lighting. Safety specifications

BS EN 62504 General lighting. Light emitting diode (LED) products and related equipment

BS EN 13032-1 Light and lighting. Measurement and presentation of photometric data of lamps and luminaires

BS EN 61347-1 Lamp Control Gear. General and Safety Requirements

BS EN 61347-2-7 Lamp Control Gear. Requirements for Battery-Supplied Electronic Control Gear for Emergency Lighting

BS EN 62384 Electronic Control Gear for LED Modules. Performance Requirements

BS EN 55015:2006 + A2:2009 Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

BS EN 61000-3-2:2006+A2:2009 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)

BS EN 61547:2009 Equipment for general lighting purposes. EMC immunity requirements

BS EN 60598-1:2015 Luminaires. General requirements and tests

BS EN 60598-2-22:2014, Luminaires. Particular requirements. Luminaires for emergency lighting

BS EN 60598-2-2:2012, Luminaires. Particular requirements. Recessed luminaires

BS EN 60598-2-13:2006+A1:2012, Luminaires. Particular requirements. Ground recessed luminaires

BS EN 60598-2-3:2003+A1:2011, Luminaires. Particular requirements. Luminaires for road and street lighting

BS EN 62612:2013, Self-ballasted LED lamps for general lighting services with supply voltages ≤ 50 V. Performance requirements.

IEC 62560 Self-ballasted LED-lamps for general lighting services by voltage > 50 V – Safety specifications

IEC 62612:2013 Self-ballasted LED lamps for general lighting services with supply voltages > 50 V - Performance requirements

IEC 62722-2-1:2014 Luminaire performance - Part 2-1: Particular requirements for LED luminaires