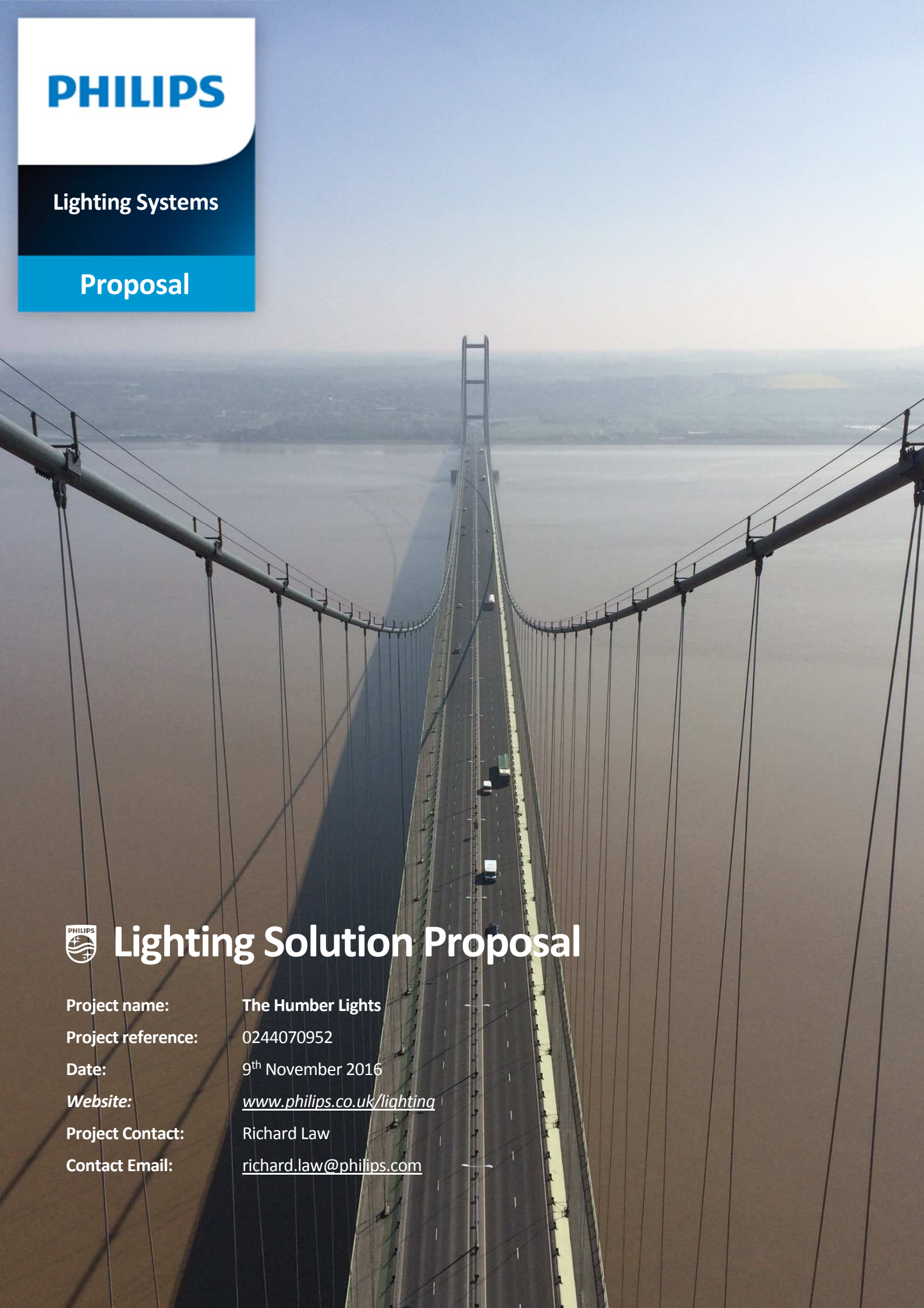
PHILIPS

Lighting Systems

Proposal



Lighting Solution Proposal

Project name:	**The Humber Lights**
Project reference:	0244070952
Date:	9th November 2016
Website:	*www.philips.co.uk/lighting*
Project Contact:	Richard Law
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Introduction

We are pleased to offer for the supply of a lighting system in support of the Humber Lights, part of the Hull UK City of Culture 2017 project, scope of works lighting the Humber Bridge. We are pleased to offer to you our response to all the requirements to provide an external lighting solution for this project using the latest LED luminaires that can create a light scene that will bring the Humber Bridge to life.

This proposal covers the supply and commissioning of the Humber bridge lighting with the integration of the Philips Color Kinetics solutions and content management services. This proposal does NOT allow for any grounds works, installation, cablings etc. or the provision of mains supply points, supply and commissioning ONLY.

In order to fully meet or exceed these demands, we have based our tender submission on our flagship lighting luminaire Series, Icolor Flex LMX Harsh environment node with our control system for our LED offer. These product ranges provide incredibly high quality, class leading efficiencies, and excellent performance characteristics combined with a very competitive price point compared with other luminaires of similar quality.

Philips Lighting is the largest supplier of professional lighting products in the world, with an extensive manufacturing and supply chain network. Lighting systems supplied together with our own control systems, they have been proven in a number of successful projects across Europe. In addition, we have the industry's largest and most experienced lighting support network including sales, operations, supply chain, distribution and aftersales. These have all been involved in the preparation of this tender and are passionate about making this project a success.

Yours sincerely

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Executive Summary

Our proposal can be summarized below:

Supply and Commission of the Lighting Solution, ActiveSite and LifeCycle Services for 1,5 years:

QTY	Description	
30.720	Customised luminaires iColor Flex LMX, Harsh environment overmold nodes, 845 customised node strings	
845	Special, Flex MX/LMX Leader Cable	
132	Power / Data supply sPDS-480ca 24V, Ethernet, High Sensitivity	
24	1000Base-SX transceivers (for OM2 fiber 850 nm)	
18	Switches	
8	Pharos LRC9659 RIO Module 8-0 (PoE)	
1	ActiveSite Gateway and ActiveSite 3G SIM Card	
1	Video Lighting Controller, VLC 500	
1	ActiveSite and LifeCycle Services for 1,5 years	
	Total Price	£2,000,160.00

Why Philips?

Philips Lighting have unrivalled experience of projects of this scale and prominence, with the ability to offer the most up-to-date lighting solutions. Additionally, and unlike other manufacturers, Philips Lighting have established an in-house expertise in the provision of complete turnkey projects, including:

- Creative support, from ideas to practical solutions.
- Architectural liaison with design team to ensure design sign off.
- Mockup and sample provisions, risk assessments.
- Start-to-finish Project management
- New technology assurances – we will offer what is current, and we know what is coming
- Full Lighting Control with schematics, commissioning and support
- Energy savings and calculations to back them up
- Complete technical package if required - CAD and lighting plots to meet regulations.
- On-site Maintenance and Support
- LG3 compliancy
- Reduced carbon foot print due to smart delivery and packaging
- Delivery management and tracking.
- Technical support with on-site engineering when needed
- Assured best practice, to CIBSE recommendations.

Our proposal will ensure that you can rely upon one, well-resourced, reliable and quality-assured company to look after all the lighting installation requirements across the entire facility. Our knowledge of the products is, of course, un-rivalled, and we have extensive knowledge of the site requirements and type of existing products, cabling routes and we understand the concepts and aspirations of the end user, so allowing us to ensure that the lighting is suitable for the purpose for which is has been designed.

Company Background

As the world's leader in lighting, Philips Lighting is driving the switch to energy-efficient solutions. With lighting consuming 19% of all electricity worldwide, the use of energy-efficient lighting will significantly reduce world's energy consumption and harmful CO2 emissions. Moreover, we are also leaders in shaping the future with exciting new lighting technologies and applications which provide attractive benefits and endless new 'never-possible before' lighting features to public and private customers in the professional as well as in the consumer market.

With our market leading position in innovative lighting design, massive investment in research and development, focus on satisfying (and exceeding) customer expectations, full control of the supply chain and nationwide resources for logistics, installation, management and customer services, we will continue to shape the future as reliable partner for ground breaking new lighting solutions.

Philips' Lighting Solution Design Process

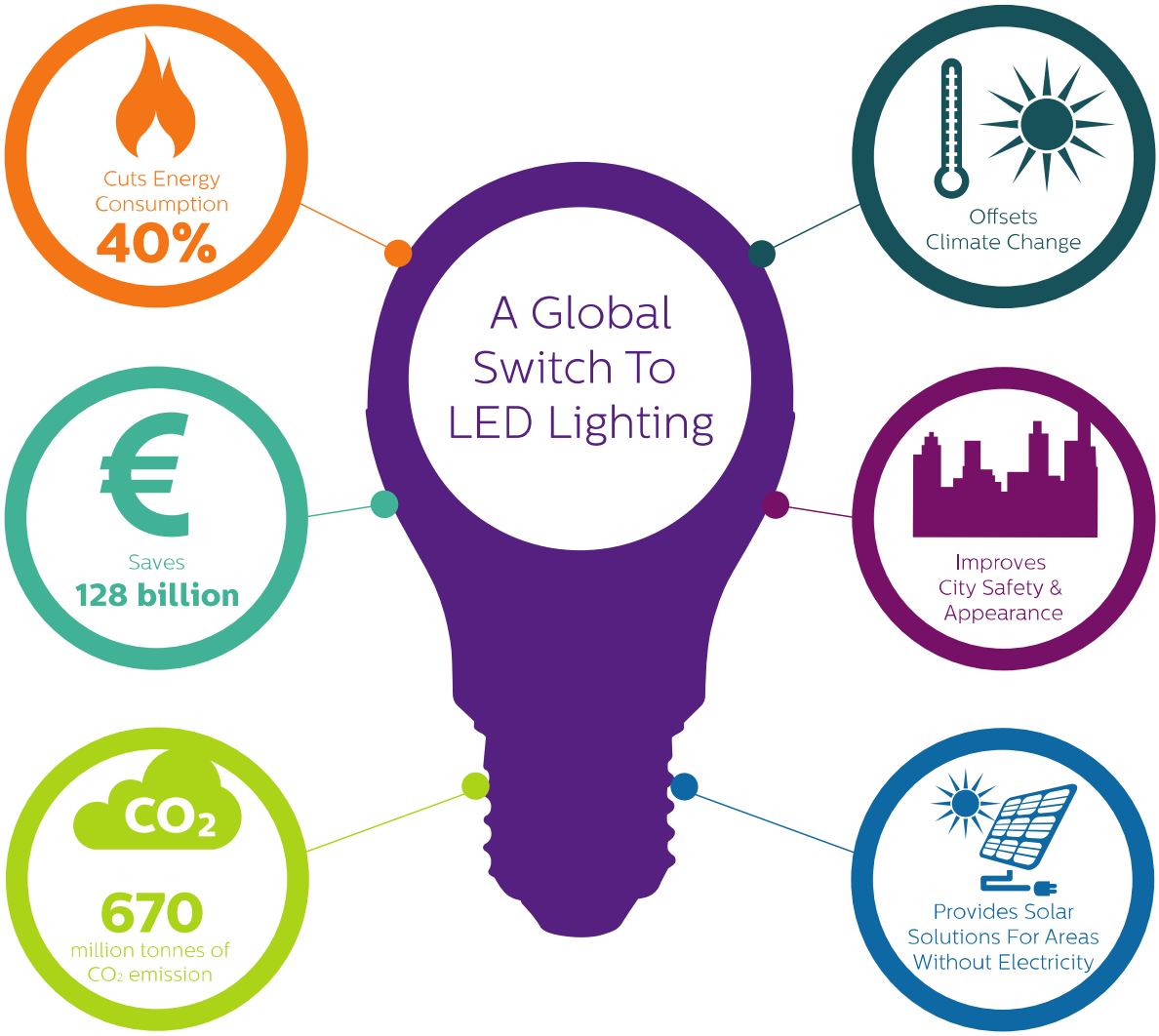
Every customer journey starts with an intake of the actual request to have a good understanding of the real customer needs. With the speed of technical innovation, it is crucial to take the desired lighting image of the customer as a starting point, rather than the requested technology.

Based on our experience, we design for the desired lighting performance by making use of our best suitable solution. This solution is created with building blocks that have been used for many years and have proven track record over lifetime. With this approach, we make sure that we deliver the best solution in terms of light performance, energy use, reliability, maintainability and serviceability, resulting in the most favourable total cost of ownership.

The next step is to verify and confirm how our proposed technical solution is capable of delivering the desired lighting image, now and over time. Within a multidisciplinary team, we gather detailed evidence to demonstrate that our solution meets the requirements, validate our solution and verify whether we are allowed to offer a solution that meets the customer's needs instead of meeting the requested specification.

In the final offer, we explain why we have chosen the proposed solution and give a transparent overview (and underpinning evidence) of its compliance to or deviation from of the requested specification. Deviating from the requested specification does not mean that we do not have the requested solution in our portfolio, but means that it is our sincere belief that we do not act in the best interest of our customer. Nevertheless, if our customer prefers another solution, we can adapt and rework our technical design and quotation.

Philips Sustainability and Environmental Focus



At Philips, we define sustainability as "meeting the needs of the present generation without compromising the ability of future generations to meet their own needs."

Sustainability within Philips Lighting is all about performance—in energy efficiency, lighting levels, user comfort, environmental impact and more. It means achieving the best output with the fewest resources. Putting this in action means sustainable investments must have an economic, social and environmental benefit. Within Philips Lighting we help our customers harness the financial benefit associated with energy savings, contribute to the security of energy supply and protect against the financial implication of carbon dioxide

Lighting Solution Proposal

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1. Submission overview

PHILIPS Lighting technical tender submission is based upon our proposal to offer lighting systems and services for:

a) **Lighting of the bridge and controls support**
b) **Design, manufacturing and delivery**
c) **Testing and commissioning**
d) **Maintenance and services**

As part of this process, we will assist with the preparation of standard compliancy, clarification items, lighting calculations, layout drawings, control topologies, commissioning and testing schedules. We will also seek to provide the appropriate level of technical support and clarification items to help in your tender submission process.

Whilst this document and all supporting design work has been prepared in good faith, the calculations, resulting values, data, comments, suggestions and conclusions contained herein are based on the information available at the time of preparation and in some cases on certain assumptions. We envisage some changes may occur given further detailed consultation which will occur naturally as the project progresses.

This document hereon in, provides a general outline of the design, methodology and implementation of the lighting and control system identified above.

1.1 Technical documentation and drawings available in the request for tender

Whilst this document and all supporting design work, calculations, resulting values, data, comments, suggestions and conclusions contained herein are based on the information available at the time of preparation and provided by the CONTRACTOR:

- **Drawings:** 17-10850 (Bridge layout) 01 to 03
- **Drawings:** 17-10850-01 (Bridge layout) Hessle Section
- **Drawings:** 17-10850-02 (Bridge layout) Barton Section
- **Drawings:** 17-10850-03 (Bridge layout) Centre Section
- **Excel spread sheet:** LED Strings and Nodes data

Star Events 10850 - Humber Bridge - LEI

The characteristics of the equipment will take into account all applicable standards and regulations in accordance with the tender specifications.

1.2 Documentation:

Please find attached the following documents in support of this submission.

- Philips submission (this document)
- Bill of Materials

BOM Humber Bridge.xlsx

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1.3 Fundamental Design

Design has been based on measurements taken by Star Events built up from their CAD drawings and excel spread sheet, node spacing's and cable lengths based on two site trials and consultation between Star Events and Philips ColorKinetics Technical department.

Technical solution
Luminaires

2. iColor Flex LMX Harsh environment nodes

iColor Flex LMX Harsh environment nodes are flexible strands of large, high-intensity, full-color LED nodes designed for extraordinary effects and expansive installations without the constraints of fixture size, shape, or space. The iColor Flex LMX Harsh environment nodes strings are specially designed for the Humber Bridge with nodes moved out to 400mm which will allow longer strings and individually addressable LED nodes, featuring dynamic integration of power, communication, and control. The flexible form factor accommodates two- and three-dimensional configurations, while high light output affords superior long-distance viewing for architectural accent and perimeter lighting, large-scale signage, and building-covering video displays.

Features / Benefits

- Each node produces full-color, daylight-visible light output of up to 11 candela.
- Clear flat and translucent dome lenses are standard. Optional marquee lenses, available in clear, semi-frosted, and translucent, snap onto flat-lens nodes to create the appearance of bulbs on a traditional theatre marquee. You can mount marquee lenses in front of a substrate or directly to mounted strands.
- Strands can be mounted directly to a surface like traditional string lights. Detachable leader cables in multiple lengths allow you to install strings at the appropriate distance from power / data supplies.
- Optional mounting tracks ensure straight linear runs, while snap-on spacers hide cabling and mounting hardware between nodes. Single node mounts can be positioned individually to provide anchor points for installations with uneven node spacing or complex geometries.
- Optional glare shields can block unwanted spill light or prevent light sources from being visible in certain applications.
- Customised dimension of node strings.
- Fully sealed for maximum fixture life and IP66-rated for outdoor applications.
- The above pictures are of the standard Flex LMX nodes. This offer is for the harsh environment version of this product.

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- Highly efficient optical systems for maximum design flexibility and high level of lighting quality
- Flicker free lighting for the latest super slow motion HDTV broadcasting quality
- Instant, dynamic control of the light
- Controls allowing creation and triggering of lighting atmospheres and sequences: DMX protocol
- Supports high flexibility in switching between different types of events
- Live monitoring of the system
- System enables interfacing with external lighting controllers, e.g. for shows
- Drastic maintenance reduction with reliable long-lasting LEDs

Color Kinetics LED system
System Design

3. System design

This section provides a brief description of the Systems Design purpose and scope. The system solution proposed is based on the requirements proposed by the Hull city, which will the capital of Culture during 2017. The scope of the project is to light the Humber Bridge, to become an interactive tourist attraction during the Hull Capital of Culture duration, and therefore as a result be an iconic landmark of the city.

PHILIPS designers have proposed to install iColor Flex LMX from Philips Color Kinetics to illuminate the cables and pillars that run high above the bridge, as well as to highlight the dramatic beauty of the bridge's architecture. The nodes are going to be specifically engineered to withstand harsh weather environments like the used ones in the San Francisco Bay area.

The proposed lighting system had to be capable of washing the bridge with beautiful, controllable, color-changing light. In addition, three more requirements need to be included as an output of the designed system.

1) Content Provision
2) Dynamic Control and near real-time
3) Sensing capabilities

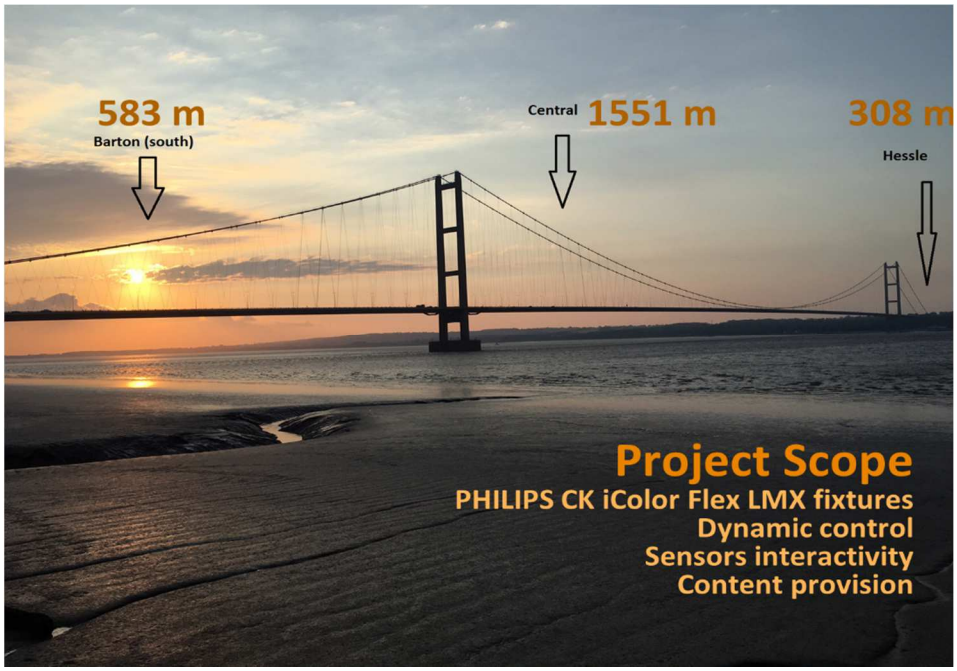


Figure 1: System Hardware Architecture.

3.1 System Overview

This section describes the high-level system architecture from a holistic point of view.

Humber Bridge lighting project involve several stakeholders with defined tasks and activities. 2017 Partnership will be responsible of the User Interface for interactivity and the sensors if input local parameters are needed. And PHILIPS Lighting will be responsible for the connected lighting system and services. The high-level architecture for this project is presented below.

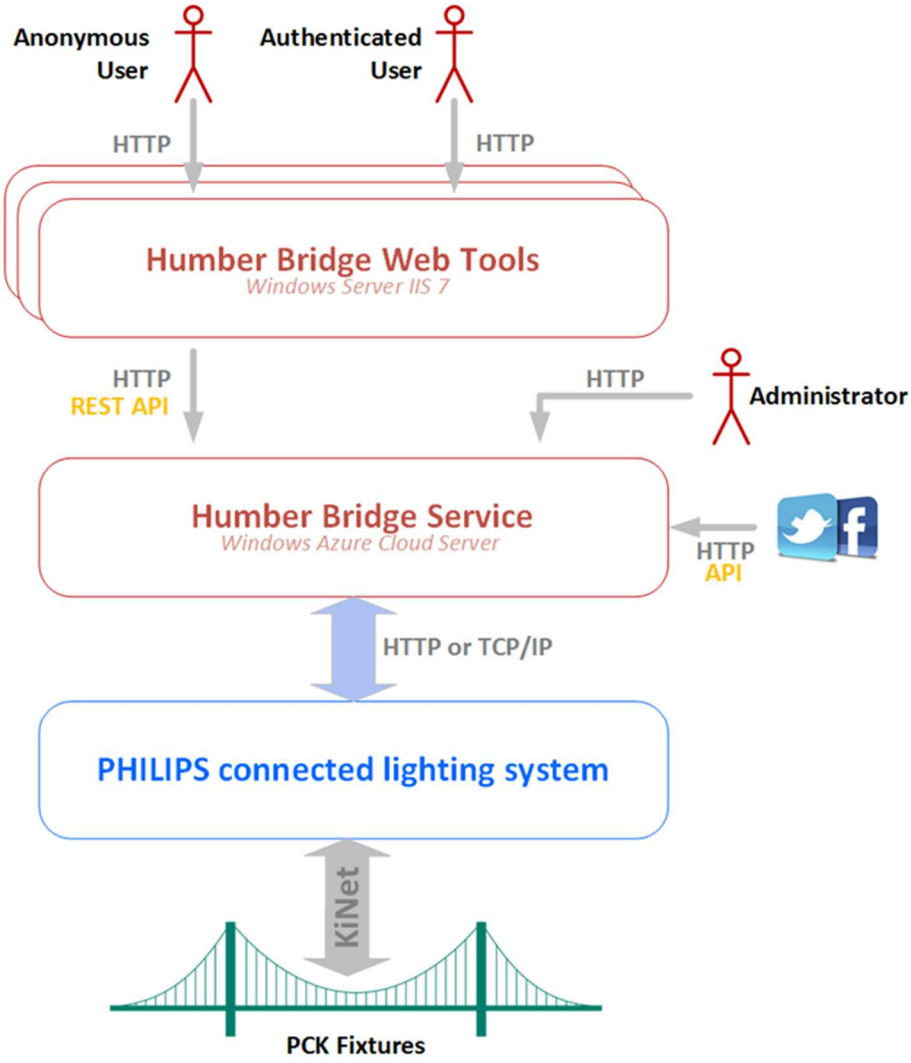


Figure 1: System Hardware high-level system architecture diagram.

The Humber Bridge Web Tools consist of a suite of web applications or native apps to engage the public to interact with the Humber Bridge lights. Providing the UI (User Interface front end).

The Humber Bridge Services building block is the responsible for converting user interactions into a series of data packets or API calls. Is formed by three sub-systems:

1. **Data Extraction Tool:** To extract data from third party sites such as Facebook or Twitter.

2. **Humber Bridge Admin Interface:** Web page for administrators for management.

3. **Visualizer Module:** Contains a set of components to deliver data packets as inputs to the PHILIPS Lighting Engine. This integration can be done via HTTP or over TCP/IP.

The Humber Bridge Services belongs to as an activity to be developed to 2017 Partnership. But, there is a need to interface with the proposed PHILIPS Lighting Engine, object of this document.

3.2 PHILIPS connected lighting system

The PHILIPS connected lighting system is under the sole scope of PHILIPS Lighting and the solution is described along this document. The main building blocks of the proposed system are:

1. **Intelligent luminaires:** Dynamically controllable lighting systems.

2. **Controls and Software for dynamically control the lighting systems.**
   - The principal components of this building block are the lighting management controller and the ActiveSite Gateway.
   - The gateway is the critical component that connects the local lighting network to the cloud-based ActiveSite lighting management software, providing secure and remote access to the lighting network.

3. **Managed services packages.**

The interface between the Humber Bridge Services developed by 2017 Partnership and the proposed PHILIPS connected lighting system for this projects can be done in three ways:

ActiveSite Lighting Management Software

ActiveSite is a connected lighting system to remotely Monitor, Maintain & Manage Philips Color Kinetics installations. Is delivered as a cloud-hosted Software-as-a-Service (SaaS) platform to:

- Know the lighting system is working flawlessly
- Detect & service any anomaly in the installation faster and remotely
- Remotely access centralized real-time content management for a refreshed lighting experience
- State-of-the-art software interface, with key features like: Status monitoring, temp monitoring, alarm management, email alerts, reports, data analytics, asset management & show content management
- ActiveSite can be seamlessly installed in both existing and new Philips Color Kinetics installations.

Lighting Management Controller

The **Lighting Controller** proposed for this project is a video lighting controller to make easy to play video content across an array of lighting fixtures, either from user-selected HD media files stored on the internal solid-state drive (SSD) or from the DVI live video input, which supports resolutions up to 1080p60. It is possible to fade seamlessly between any video content, and a range of creative effects is available, including options like text rendering. Based on individually controllable and independently running timelines and scenes, it lets you build dynamic, precise, **fully customizable programmed lighting shows.**

The extensive show control and scheduling capabilities makes easy to integrate with third-party systems and giving lots of flexibility to meet the precise needs for the Humber Bridge project.

We are able to create a custom web interface for the installation. To give to the users the control they need and the look they expect.

The lighting controller can be managed remotely using a hosted webserver using a secure VPN connection.

Interface between ActiveSite and the Lighting Management Controller

Using a secure VPN connection, you can remotely access to a specific lighting controller device to update lighting show content remotely. From the ActiveSite software interface a user/administrator can connect to the ActiveSite Gateway Control Panel and to the video lighting controller proposed for this project, allowing you the same access as you would have if you were connected to the local lighting network.

4. System Architecture

The system architecture description provides a high-level overview of the hardware, software, and interfaces that the system relies on for operations. This section includes the description of any equipment or interconnected systems and subsystems that interface with the proposed system.

The proposed PHILIPS lighting management system, is called ActiveSite, a cloud-hosted connected lighting system for remotely monitoring, managing, and maintaining architectural LED lighting installations. ActiveSite protects your brand and lighting system investments by ensuring optimal lighting system performance.

Connected luminaires are intelligent lighting fixtures that integrate with data networks to share information about their status and operation. A connected lighting system from Philips Color Kinetics (PCK) consists of intelligent luminaires, a system controller, and an ActiveSite Gateway. The gateway is the critical component that connects the local lighting network to the cloud-based ActiveSite lighting management software, providing secure access to your lighting network from anywhere in the world.

The system is delivered as a software service without the need of installing and maintaining separate dedicated IT hardware and software equipment on premise. The lighting operator shall thus be freed of any operational IT complexity and costs for maintaining such IT equipment. The system is accessible simply be logging into a standard web browser, only requiring a high-speed internet connection.

The lighting operator will receive access to ActiveSite service via hierarchical user roles. Based on this access rights, the different user groups are capable of performing different tasks and accessing levels of information.

The installation will use the Pharos VLC (Video Lighting Controller) lighting controller which makes easy to play video content across an array of lighting fixtures, either from user-selected HD media files stored on the internal solid-state drive (SSD) or from the DVI live video input, which supports resolutions up to 1080p60. It is possible to fade seamlessly between any video content, and a range of creative effects is available, including options like text rendering.

The permanent installation shall also incorporates Philips ActiveSite, a cloud-based connected lighting platform that helps to minimize downtime and allows for more efficient management of the iconic landmark with benefits including remote diagnostics, reporting, data analytics, control and content provision.

2.1.1 System Hardware Architecture

In this section, is described the overall system hardware and organization. Include brief description of each hardware components and diagrams showing the connectivity between the components.
The proposed system for Humber Bridge is enabled by a fully scalable system architecture which incorporates a dedicated controls network and software applications. An intuitive user interface, such as a tablet or laptop, can be used to manage full system functionality in a simple and convenient way.

The high-level system hardware architecture is depicted in **the following figure:**

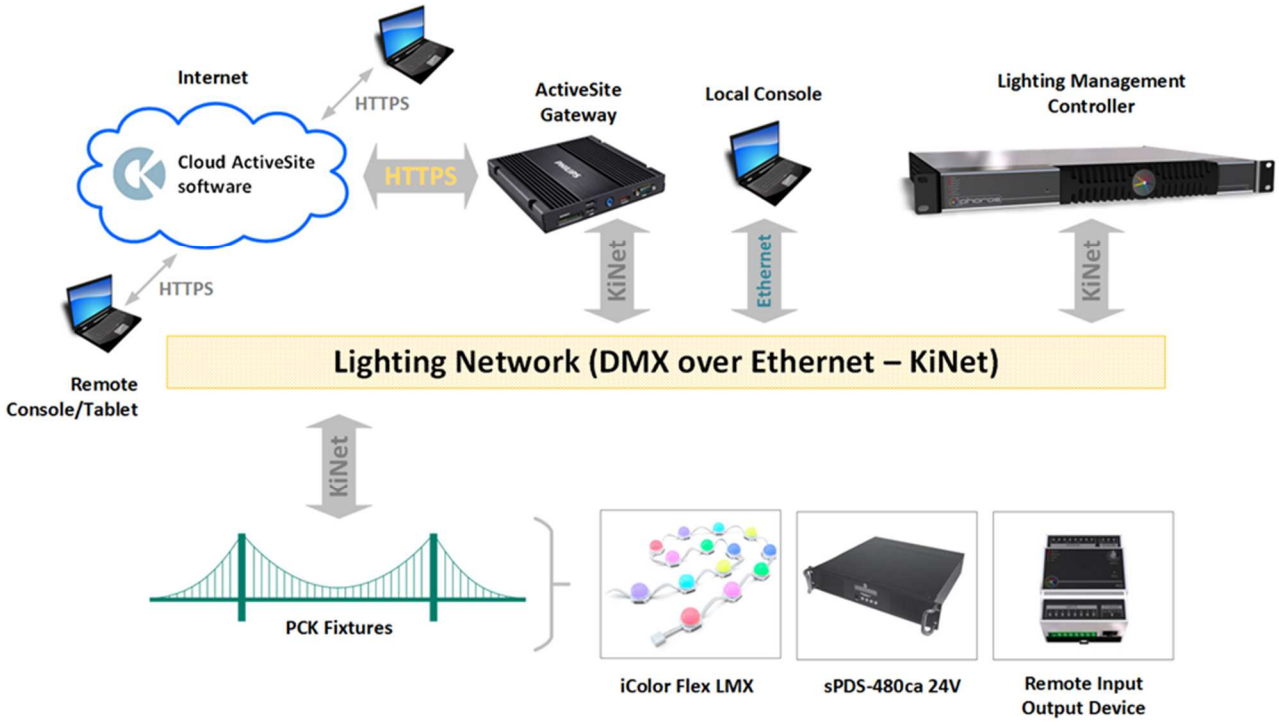


Figure 3: System Hardware Architecture.

The proposed system will use a **Lighting Management Controller** where all static and dynamic light scenes are stored within this equipment. The Lighting Controller provides a complete control of the installation. Based on individually controllable and independently running timelines and scenes, it lets you build dynamic, precise, fully customizable pre-programmed lighting shows Scenes can be triggered from the controller via commands over Art-Net, RDM/DMX over Ethernet.

A Video Controller is proposed as Lighting Management Controller, to fulfill the requirement to provide external video content and interactivity. Video controllers can coordinate tens of thousands of individually controllable points of color-changing LED light for large-scale video displays. Integration with media servers, audio systems, and advanced control solutions can create interactive and immersive multimedia experiences.

The proposed Video Controller (see Pharos VLC) supports all of the leading Ethernet communications protocols for lighting, afford native multimedia support, offer advanced if-then- else triggering and timeline scripting, and tightly integrate with motion detectors, light sensors, daylight harvesting photocells, and other building automation devices.

The proposed controller can offer a variety of triggering strategies. Through automated control through time-based triggers and astronomical clocks. You can schedule onetime events at a specific date and time, or recurring events every second, minute, hour, day, week, month, or year. Or through, advanced conditional logic for triggers and events through extensions to the Lua embeddable scripting language.

For show control and integration, Remote Input Output devices can provide a convenient and scalable way to add inputs and outputs to the proposed lighting system. Each device can be placed where it is needed along the bridge and connected to the Controllers over an Ethernet network.

The connection to our Cloud Based Lighting Management System ActiveSite is done through the ActiveSite Gateway.

The buildings blocks of the system are described in the following sub-sections.

Pharos VLC (Video Lighting Controller)

The Pharos VLC (Video Lighting Controller) is an extremely capable and cost effective solution for large LED pixel arrays; such as building façades, bridges, and presentation walls. It makes it simple to play video content across your array, either from locally stored HD media files or a DVI-D video input. It also offers a range of creative, generative effects and the versatility of powerful show control and integration features.

Figure 4: PHAROS VLC (Video Lighting Controller).

The VLC is a rugged 1U 19" rackmount unit with separate Gigabit Ethernet ports for management and DMX-over-Ethernet output. It is available in multiple variants with capacities ranging from 25,600 channels up to a massive 768,000 channels from a single unit, with further scaling by using multiple Controllers connected and synchronized over Ethernet.

To fulfil the bridge dynamic lighting specifications the controller covers the following functionalities:

- Supports Ethernet communications for lighting.
- Scalable with only extending the Ethernet network. For additional integration options simply Remote Devices needs to be added to further extend the network.
- Afford native multimedia support.
- Live video can be captured on the DVI-D input at resolutions up to 1080p60. Internal video playback at up to 1080p30 supports all major formats such as H.264/MPEG-4 AVC, MJPEG and QuickTime. The built-in 128GB SSD provides plenty of capacity for media storage.
- Allows remote management. The VLC can be connected to a network, making it possible for you to remotely manage your installation. The built-in web server lets you check the Controller's status, inputs and outputs, trigger timelines, view a full history log, etc.
- Offer advanced if-then-else triggering and timeline scripting.
- Allows the creation of web custom interfaces and multiple user levels. The built-in web server supports an extensive JavaScript API and access control with multiple user levels.

For this project the Video Lighting Controller 500 (256,000 channels eDMX) will be supplied by PHILIPS.

Remote I/O devices

The lighting controller can be triggered by any parameter that you can measure (typically data coming from sensors). The Video Controller VLC work seamlessly with remote devices, connected to the lighting controller, to gather the information from this sensors.

Figure 5: PHAROS RIO (Remote Input Output) devices.

For this project we suggest to use the PHAROS RIO 80 (Remote Input Output Device 80 - 8 input, 0 output, Serial/DMX) a microprocessor-based system specifically designed as an input/output interface for integration with lighting and audio visual controllers in an architectural or entertainment application. And should be configured by the proposed VLC over an Ethernet connection.

The PHAROS RIO 80 (“remote device”) supports the following operating modes:

- A multi-mode full-duplex RS232/half-duplex RS485 serial port. The operating mode of this port shall be set by controllers over Ethernet.
- Supports DMX output via the multi-mode serial port, configurable by controllers over Ethernet.
- Supports 8 local inputs capable of digital, analogue or contact closure operating modes. The status of these inputs shall be transmitted over Ethernet to controllers.

The RIO is Power-over-Ethernet (PoE) powered, with a rugged DIN rail mounting enclosure and install-friendly connectors.

Or in addition Internet based triggers can be created in case that there is a need to request to gather input information from Internet, allowing to interface with other systems.

The RIO 80 equipment will be supplied by PHILIPS.

ActiveSite Gateway

The ActiveSite Gateway is the critical component that uses industry-proven Philips KiNET technology to communicate with the local lighting network and the cloud-based ActiveSite lighting management software.
KiNet is the network protocol used by PHILIPS Color Kinetics to control LED fixtures (KiNet stands for DMX over Ethernet protocol).

Figure 6: ActiveSite Gateway.

The Gateway must have an active Internet connection at all times in order to upload logs to the ActiveSite cloud software and to allow remote content management. The Gateway can be connected using a wireless modem, or it can be connected to a local wired Internet connection. If 3G Modem is provided by Philips, yearly data charges will be billed to the customer.

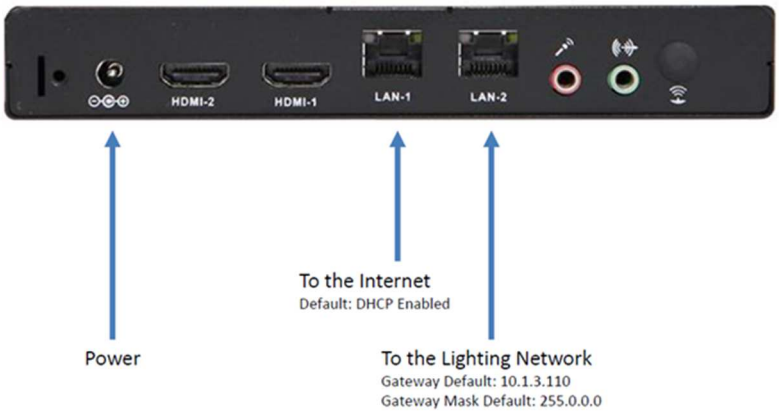


Figure 7: ActiveSite Gateway connection to the Internet and to the lighting network.

To access to the cloud-based ActiveSite lighting management software, the lighting operator only needs to have access to Internet and is easy to access to the SaaS through any web browser compatible with Google Chrome, Mozilla Firefox, and the Apple Safari browsers.

The ActiveSite will be supplied by PHILIPS.

4.1 ActiveSite Software as a Service (SaaS)

ActiveSite is a cloud-hosted connected lighting system for remotely monitoring, managing, and maintaining architectural LED lighting installations.

A connected lighting system from Philips Color Kinetics consists of intelligent luminaires, a system controller, and an ActiveSite Gateway as described in the System Hardware Architecture. The gateway is the critical component that connects the local lighting network to the cloud-based ActiveSite lighting management software, providing secure access to the lighting network from anywhere in the world.

ActiveSite offers all the benefits of a Software as a Service (SaaS) system:

- No software to install or servers to buy and maintain. All that is required is the ActiveSite Gateway, a standard internet connection, and a computer or tablet.
- Web-based software is easy to access with any authorized device
- Rapid deployment of software updates with minimal downtime
- Data backup, recovery, and security operations supported by Philips

The ActiveSite web interface is an intuitive and easy-to-use software interface that contains a horizontal navigation menu and a vertical navigation menu. The horizontal navigation menu is the primary navigation aid, providing access to information from a broad perspective that draws data from all the installation sites you can access. The tabs accessible from the horizontal navigation menu include: Dashboard, Sites, Reports, Alerts, and Users.

The vertical navigation menu is a secondary navigation aid that is only accessible from the Sites tab. This menu provides access to information specific to an individual installation site. The tabs accessible from the vertical navigation menu include: Site Overview, Devices, Site Alerts, Site Reports, Content Management, Archived Assets, and Advanced.
The remote ActiveSite content management allows the following operations:

- Schedule content
- Upload new shows
- Trigger shows
- Create dynamic scenes
- Trigger scenes
- Control content both from desktop computer or iPad/iPhones
- Create custom web interface to meet customer preferences (part of services offered)

Interned Based Triggers

The lighting controller can be triggered by any parameter that you can measure (typically data coming from sensors). This can be done using input modules, connected to the lighting controller, to gather the information from this sensors.
Or we can create Internet based triggers (gathering information coming from Internet), allowing to interface with other systems.

Lighting communication network

This sub-section is delighted to present the communication network for controlling the proposed LED lighting system for the Humber Bridge project. As currently, Ethernet is the most widely used and effective network infrastructure for medium to large architectural lighting installations we have choose this solution to provide the internal communication of the proposed system.

The lighting communication network consists of dedicated scalable local area networks (LAN) with KiNet network protocol, an Ethernet protocol defined by PHILIPS Color Kinetics to control LED fixtures (KiNet stands for DMX over Ethernet protocol). Its purpose is to allow transfer DMX512 data over a wide area using standard networking technology. All system components

are connected to the same network and can be controlled via this network through a user interface (local console) or through the main controller, the VLC. This network must be a standalone LAN, not connected to any other IP network in the bridge.

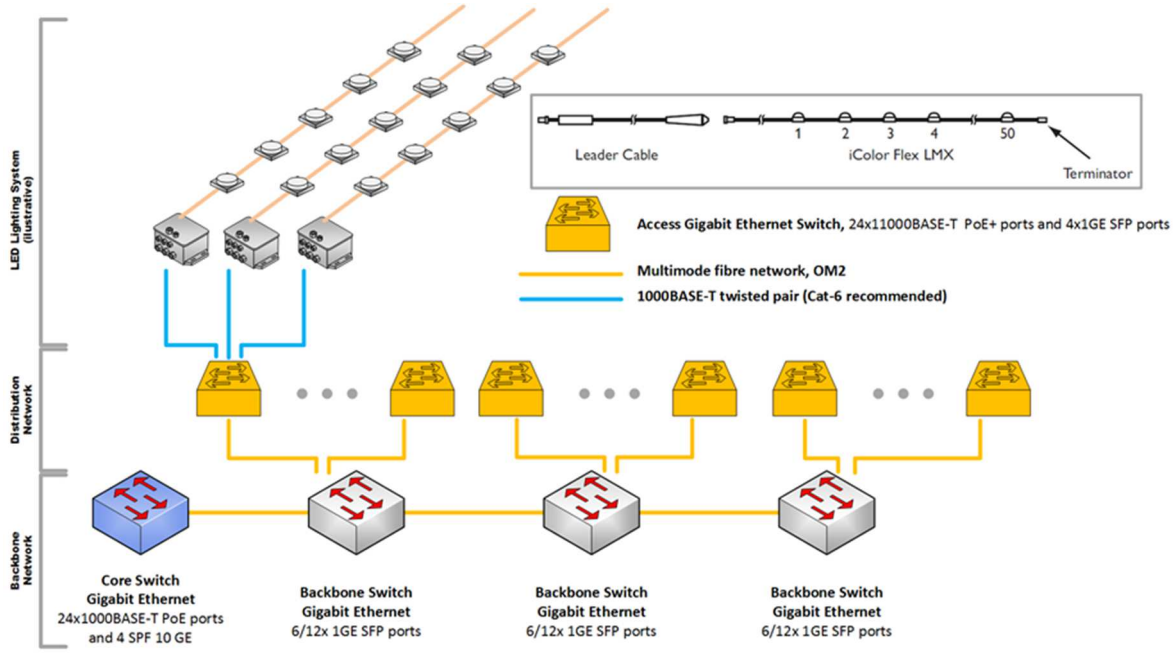


Figure 8: Lighting communication network topology.

All the hardware components proposed in section 2.1 are compliant with Gigabit Ethernet (1000Base-T) standard, therefore the bit rate requirement for the whole system is Gigabit Ethernet, which allows bit rates up to 1000 Mbps. Depending on the distances that we need to achieve the medium can be a twisted pair (Cat-6 recommended) or fiber optics if we need to fulfill distances above 100 meters.

Twisted pair cable requirements

Physical Layer Standard	Medium	Ethernet Standard	Speed	Specified Distance
100BASE-TX	Cat-5, Cat-5e, Cat-6	Fast Ethernet	100 Mbps	100 m
1000BASE-T	Cat-5, Cat-5e, Cat-6, Cat-7	Gigabit Ethernet	1000 Mbps	100 m
1000BASE-X	Cat-6, Cat-7	10-Gigabit Ethernet	10 Gbps	100 m

Fiber optics cable requirements

Physical Layer Standard	Medium	Ethernet Standard	Speed	Specified Distance
1000BASE-SX	Multimode fiber optic	FO Gigabit Ethernet for operation over multi-mode using 850 nm.	1000 Mbps	OM1 (62.5/125): ~300 m OM2 (50/125): ~600 m OM3 (50/125): 1000 m OM4 (50/125): 1040 m
1000BASE-LX	Multimode fiber optic	FO Gigabit Ethernet for operation using a long wavelength laser 1300 nm.	1000 Mbps	OM1 (62.5/125): ~600 m OM2 (50/125): ~600 m OM3 (50/125): 600 m OM4 (50/125): 600 m

The backbone of the network shall be provided through a multimode OM2 (50/125) fiber optic (850nm). Single mode fiber, because of the more expensive electronics required for it is usually used for much greater distances and this project doesn't consider to use single mode fiber optics.

The distribution network, will be done with done as well with a multimode OM2 (50/125) fiber optic (850nm), to link with the distribution network switches. From the Access switches to the Power Data supplies the communication will be done through Cat-6 twisted pair.

For Ethernet switches, it is recommended to use products that support Gigabit Ethernet compliant switches as physical Ethernet speed and provide a typical average packet latency of less than 0.2 msec.

The type of recommended switched are listed in Figure 8.

4.1.1 Physical separation between lighting and IT network

The lighting and IT network shall be separated: the only connection is formed by the Ethernet switches.

4.1.2 Installer scope of works

The installer will supply the following equipment:

- Supply, installation and commissioning for the fiber optic backbone
- Supply, installation and commissioning for the optical switches
- Supply, installation and connections for the Ethernet bus between the switches and the Power Data Supplies (sPDS-480ca 24V)
- Supply, installation and connections for the Supply Cable between the Power Data Supplies and the strands of LED nodes (iColor Flex LMX)

4.1.3 Supply Cable

In no event will Philips be held liable for any damages, including direct or indirect damages, losses or expenses arising from dysfunctionality of the supply cable.

4.2 Lifecycle and ActiveSite Services

We can support you in guaranteeing the availability and performance of your lighting installation solution and assisting you in all activities needed to do so.

In order to secure that we offer you services that fit your business needs, we offer Essential Service Package to protect your investment:

- With the Essential service package, we deliver remote support, combined with regular system health checks and software updates for an agreed time after installation.
- Access to Active Site platform
- With the Essential service package you are assured of:
  - Helpdesk access and service ticketing
  - Preventive maintenance via system health checks
  - Specialist expertise for remote support, diagnostics and fault finding
  - Service parts and additional services at discounted prices

The Lifecycle and ActiveSite Services are summarized below:

System execution	
Handover	2 days - the handover of installation
Operations	
Remote Monitoring. **ActiveSite remote activity**	Remote recommissioning. 2 hr / month of remote monitoring.
Content Management. **ActiveSite remote activity**	Remote content management, up a max. 12 content management/year consultation of max 2 hr/session
Preventive	
System health check **+ Onsite Content Management. ActiveSite**	1 day on site 1 eng. to do the System Health Check 1 eng. to do Content Management (5 times per year)
Corrective	
Service ticketing (within business hours)	Philips provides the customer with a helpdesk number and an e-mail address to establish contact for registering service requests (service ticketing). A service ticket can be a complaint, request for maintenance or request for information.
Remote diagnostics and fault finding (within business hours)	Up to a max. Of 10 hrs/year. In case of a defect, Philips remotely connect (online or via phone with customer expert) to the customer's system to identify the failure mode, potential root cause analysis and an advice on resolution.

Comprehensive	
Service Parts kit at Acceptance	Philips provides the customer with a pre-defined set of service parts to perform the lifecycle service. The customer is the owner of the service parts and responsible for the replenishment during the term of the agreement, unless covered by supply of service parts for defects, in which event Philips shall replenish those defective parts that have been returned to Philips at agreed intervals or batches.
Supply of service parts for defects	After the contract agreement
Supply of service parts for group replacements	After the contract agreement

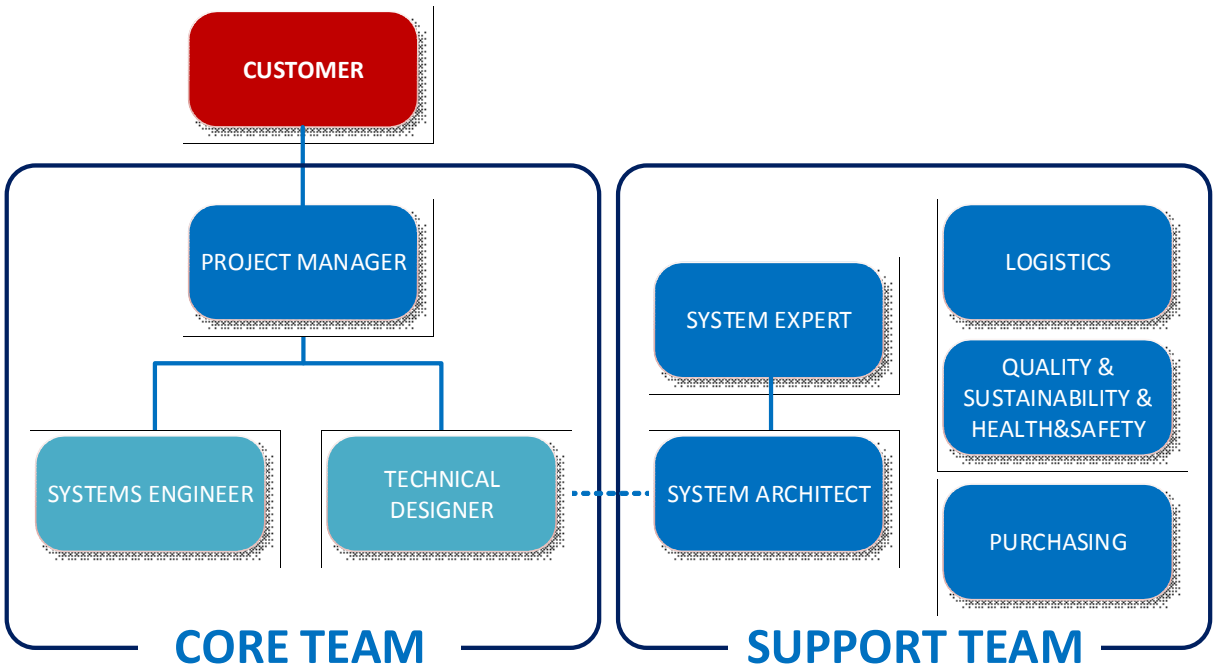
5. Project Services and roles

1.1. Project Core Team

Upon award of the contract, we will assign a core team to ensure your project is executed with utmost care and in optimal circumstances, and delivers the agreed performance taking into account standardization and consistency across the project. The core team will be located at the Philips Lighting's offices and will be driven at least by a dedicated Project Manager a Technical Designer and a System Engineer.

1.2. Project Support Team

As industry leading designer of innovative Lighting Systems and Services, we have a world-class team of specialist available to bring in all required expertise and to ensure a rapid start-up and alignment with your project goals and expectations.



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1.2.1. Project Manager

Our project managers will focus on executing the project according to agreed specifications, schedule and quality levels. The Project Manager will be your single-point of contact for all project related questions or remarks. To meet the expectations, the Project Manager will take care of:

- Developing the implementation plan including purchasing, quality, safety management as well as clear roles and responsibilities
- Coordinating the execution of all project tasks with the different stakeholders according to mutually agreed schedule
- Delivering the agreed system performance
- Coordinate mock-up
- Coordinating Factory Acceptance Test (FAT) activities
- Coordinating Site Acceptance Test (SAT) activities and (pre)commissioning
- Being the single-point of contact for the customer.

1.2.2. Technical Designer

Our designers will develop the systems design. System design will include control specs, drawings, functionalities as well as documentation to be sent to installer. Technical designers and System Engineers will work collaboratively to ensure specs and features fulfilment.

1.2.3. System Engineer

Our System Engineer will ensure the chosen solution is implemented and commissioned according to the agreed acceptance criteria. The system engineer will be responsible for FAT and Field Tests (if applicable).

1.2.4. Support Team

Our System Architects and System Experts are available to support the core team with thorough application and system expertise during execution of the project, if needed.

1.3. **Project kick-off**

Our Project Manager will initiate the first meeting with the customer to kick-off the project execution. Key members of the project team will attend this meeting to review and confirm the scope of the project, define the project schedule and the communication protocol between our project team and the customer project team.

1.4. In-house Engineering

We will pre-configure the system by using standardized methods and proven tools. Making use of a standardized basic configuration will allow for coherence over the application platform and ease of maintenance, when needed. Moreover, a user-friendly interface with dynamic screens will allow for an easy and intuitive access and management of the lighting system or interface with a customer developed front end interface. Finally, project specific, tailor made engineering will ensure the final solution to answer your needs and exceed your expectations. Deliverables for the in house engineering include detail control schematic for the installer.

1.5. On-site Works

1.5.1. Site Acceptance Tests

After installation, the Site Acceptance Tests (SAT) will be executed according to our standard procedure. During the SAT tests will verify (at minimum, but not limited):

- Correct installation of grounding and power wires.
- Correct installation of telecom wires.
- Suitable installation of control modules and processors.
- Functionality of the different subsystems, universes, controllers and gateways in our scope.

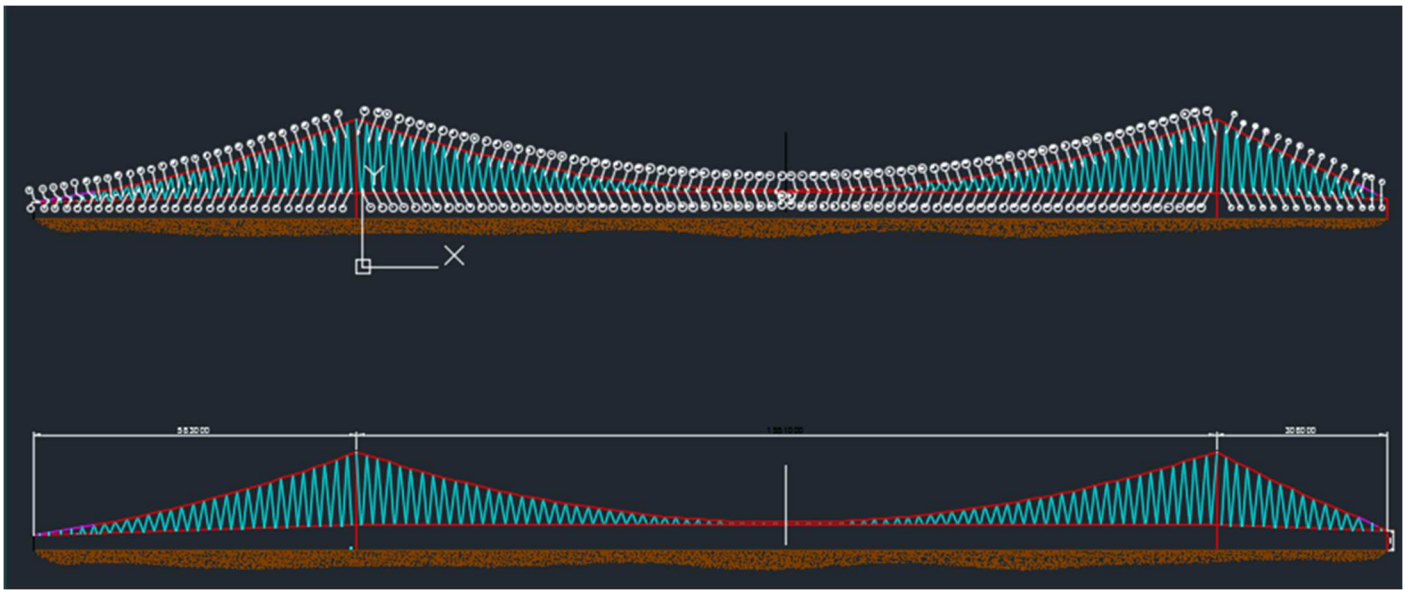
1.5.2. Commissioning

After completion of the SAT tests, we will commission the lighting system. Commissioning will ensure that all configuration and setting activities are executed to make the system ready for operation. During commissioning, the presence of an electrical installer or representative of the customer is required.

1.6. Training

Depending on the nature of the project, applied products and required services, we will train the users of the lighting system on how to operate their system.

Design Authority



The proposal has been provided in order to demonstrate how Philips lighting products could be arranged in order to facilitate the requirements particular to the relevant project, and is therefore only a suggested lighting design.

This information is provided subject to the following limitations:

- Philips has not undertaken any risk assessment for this design. Philips will not be held liable for any risk associated with the implementation of the design.
- Philips may not have had physical access to the site of the project to verify the information which has been provided and the proposal is therefore based solely on information provided by the customer to Philips. The customer is therefore responsible for ensuring that the proposal can be safely implemented in compliance with any laws and regulations.
- Accordingly, the information contained in the proposal does not constitute a design for the purposes of the Construction, Design and Management Regulations 2007 and Philips does not accept or assume the role of designer.

The proposal should be considered as guidance only and must not be used in place of the final principal or construction drawings. Philips recommends that in the event that this proposal is taken forward as the preferred solution, that the calculations and arrangements are first scrutinised, verified and approved by a suitably qualified designer before being transposed onto the relevant working drawings as appropriate

Customer Responsibility

Unless expressly specified, the quotation does not include for: -

- Any building work, cutting away, making good or redecoration
- Removal or reinstatement of all stock, furniture's and fixings necessary to unimpeded access
- Removal and replacement of ceilings or ceiling tiles
- Specialist access equipment other than normal MEWP's or other equipment specifically detailed in this proposal
- Provision for a safe working light level in all areas
- Washing and toilet facilities
- Any telecommunication services.

The Customer is asked to advise the Company before work commences on the existence of - and point out to the Company's Engineer's the location of:

- Concealed water, gas, electricity, telephone or other services, wiring or pipes. In the absence of such advice, we cannot accept liability for damage to these services nor any consequential loss
- A safe means of access to and from all working areas in line with the current health and safety regulations and provision of lighting, washing and toilet facilities.

The equipment supplied for this project will be guaranteed in line with our Terms and Conditions.

Terms and Conditions

1 QUOTATIONS AND ORDERS

1.1 These Conditions apply to and form an integral part of all quotations, offers, acceptances, acknowledgments and confirmations by Philips of any orders by Customer, unless and to the extent Philips explicitly agrees otherwise in writing.

1.2 Any terms and conditions on any documents issued by Customer either before or after issuance of any document by Philips referring to these Conditions are explicitly rejected and disregarded by Philips, and any such terms shall be wholly inapplicable to any sale by Philips to Customer and shall not be binding in any way on Philips.

1.3 A quotation will be valid for the period stated by Philips, or where no period is stated, within 30 days from the date of the quotation.

1.4 No order submitted by Customer shall be deemed accepted by Philips unless and until confirmed in writing by Philips.

2 PRICES AND PAYMENT

2.1 Unless otherwise agreed in writing between Philips and Customer, prices shall be those applicable at the date of the invoice, exclusive of VAT.

2.2 Philips reserves the right to vary the price of goods to take account of any variations in costs including but not limited to any foreign exchange rates, raw materials and other costs of manufacture and distribution, taking effect between quotation and delivery.

2.3 Customer shall pay for the Goods (less any discount to which it is entitled but without any other deduction) not later than the last bank working day of the month following the month in which the Goods were invoiced, unless otherwise agreed in writing. Any query by Customer relating to an invoice must be made in writing within 30 days of the date of invoice.

2.4 Philips shall be entitled to bring an action for the price whether or not the property in the Goods has passed. Time for payment shall be of the essence.

2.5 In the event of default in payment by the due date, Philips reserves the right to charge interest on money overdue in accordance with the Late Payment of Commercial Debts (Interest) Act 1998 (as amended), until payment in full is made, and to suspend delivery or terminate the contract in respect of any undelivered Goods, and appropriate any payment made by Customer as Philips thinks fit.

3 DELIVERY

3.1 A delivery date shall be treated as being approximate and Philips shall not be liable for any delay in delivery, provided that it uses commercially reasonable efforts to meet the delivery date. Philips reserves the right to charge for any special delivery arrangements and for all pallet equipment not returned to Philips within 60 days of receipt.

3.2 Customer will sign an advice note on receipt of the Goods. If Customer specifies "unexamined" or similar wording Philips will treat that as confirmation of receipt of all the Goods in the advice note. Any loss or damage to Goods found on delivery, and any non-delivery of a whole consignment, must be notified in writing to the carrier and to Philips within 7 days. Damaged Goods and associated packaging should be retained for examination.

3.3 If Customer fails to take delivery or give adequate instructions or requests Philips to hold the Goods after the agreed date for delivery, payment will be due and payable 30 days from the date the Goods were available for dispatch, or Philips may at its option sell the Goods and (after deducting all reasonable storage and selling expenses) charge Customer for any shortfall below the contract price.

3.4 Philips shall be entitled to determine the route and manner of delivery of the Goods, and make partial deliveries of the Goods or deliver the Goods in instalments.

3.5 Where Goods are to be delivered in instalments, each delivery shall constitute a separate contract.

4 TITLE AND RISK

4.1 Immediately upon delivery, risk in the Goods will pass to Customer.

4.2 Title in the Goods will not pass to Customer until Philips has received full payment for:

4.2.1 the Goods.

4.2.2 for any other Goods that Philips has sold to Customer for which payment is outstanding.

4.3 Until title passes Customer holds the Goods on behalf of Philips as bailee and must keep the Goods free from any charge, lien or other encumbrance and shall keep the Goods identifiable and separate from other property in its possession.

4.4 Customer has the right to resell the Goods but not as Philips' agent and Philips may terminate that right at any time prior to full payment being made but in any event upon the insolvency of Customer.

4.5 In the event of a breach of these Conditions, Customer shall fully cooperate with Philips in order to enable Philips (or its representative) to collect the Goods.

5 RETURN OF GOODS

Goods delivered will not be accepted for return, nor any credit given, without prior written consent of Philips and unless the Goods are returned in accordance with any applicable Philips' return procedure. Any costs incurred by Philips in handling or disposing of the Goods will be borne by Customer.

6 WARRANTY

6.1 Philips warrants that at the time of delivery, the Goods will correspond with their specification and will be free from defects in material and workmanship for the relevant Philips business's stated warranty period, subject to the following conditions. Philips shall be under no liability in respect of:

6.1.1 any defect in the Goods arising from designs or specifications supplied to Philips by Customer;

6.1.2 any defect arising from Customer's failure to follow Philips' instructions in relation to proper use and storage of the Goods;

6.1.3 any defect arising as a result of: excessive wear and tear; the Goods being incorrectly fitted; being subjected to neglect, carelessness or abnormal conditions; accident; or any attempt at repair, replacement or modification made without the prior written agreement of Philips;

6.1.4 any labour costs, (de)mounting and/or (de)installation of the Goods.

6.2 Philips shall be under no liability under clause 6.1 where the terms of payment set out in clause 2 have not been complied with by Customer.

6.3 If a Customer notifies Philips that it has a claim and if Philips reasonably agrees that the claim is valid, Philips has the option to refund the cost of the Goods, or repair or replace the Goods. Philips is entitled at its option to replace the defective or non-confirming Goods with goods that have minor deviations in design

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and/or specifications not affecting the functionality of the agreed Goods.

7 REMEDIES AND LIMITATION OF LIABILITY

The following sets out Philips' liability to Customer in respect of or in connection with the supply or any failure to supply Goods under these Conditions, whether in contract or tort, including negligence, and are Customer's sole remedies in respect of any act or default on the part of Philips.

7.1 Philips will accept liability for death or personal injury resulting from its negligence, for any breach by it of Section 12 of the Sale of Goods Act 1979, for fraud or for fraudulent misrepresentation, and for any other liability which cannot be excluded by law.

7.2 Philips will accept liability for direct physical damage to the tangible property of Customer to the extent that it is caused by the negligence of Philips, subject to the exclusions set out in clause 7.4 and up to a maximum limit of £2,000,000 in aggregate

7.3 Except as provided in clauses 7.1 and 7.2, Philips' total liability in respect of any one default will not exceed 125% of the total purchase price of all the Goods in respect of which Philips is in default. If a number of defaults give rise to substantially the same loss or are attributable to the same or similar cause, then they will be regarded as giving rise to only one claim. Philips will be given a reasonable opportunity to remedy any default.

7.4 Except as provided in clause 7.1 and 7.2 Philips will not be liable for:

7.4.1 loss of business, revenue, profits, anticipated savings (even where the same arise directly from a breach of these Conditions); or

7.4.2 special, indirect or consequential loss, even if such loss is foreseeable by or in the contemplation of Philips.

7.5 Except as expressly stated in this clause 7 all conditions and warranties implied, statutory or otherwise are excluded to the maximum extent permitted by law.

7.6 Any claims for rebates or credits shall only be valid if made within 3 months of the expiry of the period to which any written agreement to give such rebates or credits applies, or where no such agreement has been made, within 12 months of any grounds for such claim.

8 INTELLECTUAL PROPERTY

8.1 Where software or documentation is embedded in or delivered with the Goods, the sale of the Goods shall not constitute a transfer of title in the same to Customer but shall only imply a non-exclusive and non-transferable licence of any intellectual property right, including but not limited to patent, copyright, trademark, design right or trade secret ("IPR") belonging to Philips, to use the same with, and as embedded in or delivered with, the Goods as supplied by Philips.

8.2 Notwithstanding anything to the contrary herein, these Conditions shall not be construed as conferring any right, licence or immunity, either directly or by implication, estoppel or otherwise to Customer or any third party under any Philips IPR or IPR of any third party other than explicitly granted under these Conditions.

8.3 Customer shall not:

8.3.1 modify, adapt, alter, translate or create derivative works from any software embedded in or provided by Philips with the Goods;

8.3.2 assign, sub-license, lease, rent, loan, transfer, disclose or otherwise make available such software;

8.3.3 merge or incorporate such software with or into any software, or

8.3.4 reverse assemble, decompile, disassemble or otherwise attempt to derive the source code for such software, without written authorization from Philips, except as expressly permitted under English law.

8.4 Customer shall reproduce, without any amendments or changes, any proprietary rights legends of Philips and/or its affiliates or its third party suppliers in any software or documentation provided by Philips.

8.5 If to the extent copyright in the software is owned by third parties, the licence terms of these third parties shall apply instead of these Conditions to such third party software.

8.6 Philips, at its sole expense, shall:

8.6.1 defend any legal proceedings brought by a third party against Customer to the extent that the proceedings include a claim that the Goods directly infringe the claimant's IPR; and

8.6.2 hold Customer harmless against damages and costs awarded by final judgment in such proceedings to the extent directly and solely attributable to such infringement.

8.7 Philips shall have no obligation or liability to Customer under clause 8.6:

8.7.1 if Philips is not promptly notified in writing of any such claim and given sole right to control and direct the investigation, preparation, defence and settlement of such claim, including selection of counsel, with the full reasonable assistance and cooperation of Customer;

8.7.2 if the claim is made after a period of 3 years from the date of delivery of the Goods;

8.7.3 to the extent that any such claim arises from modification of the Goods, or design, specifications or instructions furnished by Customer;

8.7.4 for unauthorized use or distribution of the Goods or use beyond the specification of the Goods;

8.7.5 for any costs or expenses incurred by Customer without Philips' prior written consent;

8.7.6 for the infringement of any third party's IPR with respect to which Philips has informed Customer, or has published a statement, that a separate licence has to be obtained.

8.8 For such claims of infringement referred to in clause 8.7, Customer shall indemnify Philips and its affiliates against any losses, damages, costs or liabilities in respect of such claims.

8.9 If the Goods are, or in Philips' opinion are likely to become, the subject of a claim of infringement as referred to in clause 8.6, or if Philips receives a third party IPR infringement claim in relation to the Goods, Philips shall have the right, without obligation or liability, and at its sole option to:

8.9.1 procure for Customer the right to continue to use or sell the Goods; or

8.9.2 provide non-infringing replacement Goods; or

8.9.3 modify the Goods in such a way as to make the modified Goods non-infringing; or

8.9.4 repurchase the Goods from Customer for the initial price paid by Customer less reasonable depreciation; or

8.9.5 suspend or discontinue supplies to Customer of the Goods or parts to which such notice relates; or

8.9.6 terminate any agreement to the extent related to the Goods.

8.10 Subject to the exclusions and limitations set forth in clause 7, the foregoing states Philips' entire liability and obligation to Customer and Customer's sole remedy with respect to any actual or alleged infringement of any IPR or any other proprietary rights of any kind.

9 BREACH

9.1 Without prejudice to any other right or

remedy, a party not in breach will be entitled to consider the other party in breach and may promptly terminate any contract and/or suspend any further deliveries and bring an action in accordance with clause 2.4 if:

9.1.1 a party commits a material breach of the contract and fails to remedy the same within 14 days of receiving written notice to remedy from the other party (however, late payment requires no such notice); or

9.1.2 either party or its parent or subsidiary companies as defined in s1159 of the Companies Act 2006 make any voluntary arrangement with creditors or becomes subject to an administration order, or if an individual or firm, becomes bankrupt or, if a company, goes into liquidation (otherwise than for the purposes of amalgamation or reconstruction); or

9.1.3 a receiver or administrative receiver is appointed over, or an encumbrancer takes possession of any of a party's property or assets or the property or assets of its parent or subsidiary companies or a party ceases trading or threatens to cease trading or any distress or execution is levied on a party, its goods or assets; or

9.1.4 the control or ownership of Customer changes; or

9.1.5 a party has reasonable cause to believe that any of these events is about to occur to the other party.

10 CONFIDENTIALITY

Customer acknowledges that all technical, commercial and financial data disclosed to Customer by Philips and/or its affiliates is the confidential information of Philips and/or its affiliates. Customer shall not disclose any such confidential information to any third party and shall not use any such confidential information for any purpose other than as agreed by the parties and in conformance with the purchase of the Goods.

11 EXPORT CONTROL

If the delivery of the Goods is restricted or prohibited due to export control regulations, the rights and obligations of Customer will be suspended for the duration of such restrictions or prohibitions, and this agreement may be cancelled without liability. Customer warrants that it will comply in all respects with the export, re-export and transfer restrictions set forth in any applicable export control laws and regulations or export licenses and that it will impose the same on any third party to whom the Goods are sold. Customer shall take all actions which may be reasonably necessary to ensure that no such party or end-user contravenes such regulations and shall indemnify Philips and its affiliates against any losses, damages, costs or liabilities arising from claims resulting from Customer's or its customers' breach or non-compliance with this clause.

12 GENERAL

12.1 Neither party shall be liable to the other for any breach arising from, (and Philips may in its discretion allocate products, so as to supply fewer Goods than agreed, in case of), events beyond the reasonable control of such party or its sub-contractors or suppliers including but not limited to acts of God, war, riot, fire, strikes, terrorism, lock-outs or other forms of industrial action.

12.2 These Conditions may not be amended, varied or modified except in writing signed by a duly authorised officer or representative of each of the parties.

12.3 Failure or delay by a party in enforcing or partially enforcing any provision of these Conditions shall not be construed as a waiver of any of its rights under any contract.

12.4 If any provision of these Conditions is found to be invalid or unenforce¬able in whole or in part, the validity of the other provisions and the remainder of the provision in question shall not be affected by that invalidity or unenforceability.

12.5 These Conditions are subject to English law and the parties submit to the non-exclusive jurisdiction of the English Courts.

12.6 Any terms and conditions which by their nature extend beyond expiration or termination of these Conditions shall survive and remain in effect.

12.7 Prices do not include any fees arising from the WEEE Directive or similar legislation, and such additional costs will be invoiced to and payable by Customer.

12.8 Each of the parties acknowledges that, in entering into this agreement, it has not relied on any oral or written representation, warranty, or other assurance (including any information contained in catalogues, price lists, advertising matter and specifications), except as provided for or referred to in these Conditions.

12.9 IMPORTANT – ETHICAL COMPLIANCE – Philips expects its customers to uphold the highest ethical standards and to comply fully with The Bribery Act and with all other applicable legislation relating to bribery and corrupt practices (which may include the United States Foreign Corrupt Practices Act). Customer will fully co-operate with Philips (including by the provision of any relevant documents or other information) in the event that Philips receives information of Customer's non-compliance with such standards. If the Customer fails to comply with the terms of this clause, Philips shall be entitled to terminate any agreement without liability and Customer shall indemnify Philips against any losses, damages, costs or liabilities which may arise.

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13.1 . **Programming & configuration** A minimum of 20 working days' notice is required before a Philips Engineer can attend site to carry out programming & configuration. A completed and signed Engineer Request Form (ERF) must be submitted to Philips Customer Services 14 days prior to when site attendance is required. This form must clearly state that the site is ready for the Engineer to commence work in accordance with the questions asked on the form. Should this condition not be satisfied prior to the visit, the abortive visit will be charged at our current day rate. Please be aware that programming & configuration consists of both on site and off site work. The form must specify the date of the requested visit and include an official purchase order number for the specific work being carried out. Our programming & configuration quote is based on Philips standard working hours Monday – Friday 8.30 - 5.00pm (Inclusive of travel) unless otherwise stated. Any out of hours (OOH) working will require an additional order to cover additional costs in accordance with our current OOH rates.

13.2 **Upgrade Projects** Where a Project is in effect an upgrade to an existing system it will be assumed that the existing system has been maintained to a satisfactory standard by Philips. Remedial works are not included in this proposal unless specifically stated. If remedial works are required Philips will offer to undertake the necessary works and will raise an appropriate quotation.

13.3 **O&M Manuals** Philips will provide product guides in the form of Technical data sheets and system schematics. Any additional information in the form of extensive O&M manuals can be made available at an additional charge.

13.4 **System schematics** Schematics are provided for guidance purposes only, to provide a generic outline. Schematics should not be viewed as wiring diagrams. Please note that Philips, whilst providing such information, does not act as the design authority.

13.5 **Compatibility** Clients must satisfy themselves that lamps, luminaires, third party equipment already installed or intended to be installed are of a suitable quality and standard to work effectively with our products as defined in our Technical data sheets. A full compatibility check can be performed prior to installation at an additional cost. Quotations are available on request.

13.6 **Warranty** An extended 60 month warranty is offered on all products from date of delivery on a "back to base" returns basis. No warranty is offered on the overall installation, its wiring or other devices not supplied by Philips. All warranty requests to attend site will be charged for at the prevailing day rates, prior to our attendance. A full refund of this cost will be given if the product is found to be faulty due to manufacturing defects. The full terms of our warranty provision can be supplied on request.

13.7 **Returns policy** Returns will only be authorised if an item is faulty due to manufacturing defects within the Warranty period. The warranty period is 24 months from delivery of goods. Items that have been incorrectly ordered or are simply not required cannot be returned. This does not affect your statutory rights.

All returns need to be pre authorised through our Customer Services team +44 (0)1483 293086.

13.8 **Scene setting** Philips will provide scene setting to an agreed written specification that was provided prior to this quotation. If no specification has been provided, basic scene setting will be completed to allow for an effective demonstration that the system is fully functioning. Philips reserves the right to request an additional order to cover additional labour and time on site for scene setting that is clearly beyond the scope of the original quotation.

13.9 **Touchscreens** If any Touchscreens are included in this proposal the client should provide full details of their operation as part of the original specification. Failure to provide such a specification will result in the costing for any Touchscreen programming to assume a basic level of functionality; similar to that provided by a standard Keypad.

13.10. **Keypad engraving** Full details on specific requirements must be provided when Keypads are ordered; generic templates are available from Philips for this purpose. Failure to provide such information will result in Keypads being supplied with standard engraving.

13.11 **Purchase Order** This proposal is based on Philips supply of equipment and providing programming & configuration and maintenance support on a purchase order only basis. We are unable to accept retention of monies and sub-contract arrangements are subject to further agreement of conditions.

14.1 **Envision Manager systems** Philips will not provide computer hardware unless requested. The Customer is to provide all IT hardware according to current Envision Manager system requirements. Microsoft Windows XP or Vista should be installed on Servers. Full administrative rights should be provided to the Philips engineers to allow them to configure the Envision Manager.

15.1 **Direct connection based systems** The Dynet network should be wired to the computer/server location. The customer will require a USB to Dynet Bridge (PC node) to allow connection between the computer/server and the Dynet network.

16.1 **LAN based systems** The Server / computer should be connected to the client LAN and properly configured for LAN access.

16.2 The LAN infrastructure should be fully operational and if using the client's LAN, all IP addressing information of each LAN point given to Philips prior to commencement of programming and configuration.

16.3 **VPN access** An account should be provided for the Philips engineer to enable Remote Desktop commissioning and file transfers

16.4 **Dynalite LAN Bridges** A full database will be required for all static IP addresses and network configuration. All Bridges are to be connected to the clients LAN sockets and fully patched through. IT support will be required from the customer on site in order to test network integrity.

16.6 **IT support** It is assumed that IT support will be provided by the clients IT specialist provider throughout the project, at no charge to Philips.

17.1 **Scope** Please note that whilst every effort is made to ensure the accuracy of the advice that is provided by Philips, it is the responsibility of the customer to ensure the products and quantities on offer under this proposal fully comply with the requirements of the application. Where Philips has provided design advice the final responsibility for ensuring that this advice is suitable for your purpose resides with you.

PHILIPS

Warranty policy - Luminaires

This document sets out the warranty policy of the Philips (sales) organization ('Philips') from which you ('Purchaser') purchase your professional luminaires. This policy is applicable only to Philips branded professional products ('Products') purchased from January 2014 within Europe.

This warranty policy is subject to the provisions set out below and is subject to the attached terms and conditions ('Warranty Terms and Conditions').

This warranty policy only applies if referred to in a sales agreement between Philips and the Purchaser and it will replace the standard warranty clause provided in the Philips general terms and conditions of sale.

5. Warranty period

Subject to the provisions as set out in the Warranty Terms and Conditions, Purchaser receives the warranty for the applicable period – in this instance for 5 years.

6. Special conditions

- The warranty period starts on the date of invoice.
- The warranty period is general based on a burning behaviour of max.4000 hours/year or equivalent, taking into account the operation of control systems. It is understood that this application will exceed the burning hours, and this has been taken into account for this offer.
- This warranty policy is only valid when products are properly installed and operated in application conditions as specified in the product datasheet.
- Purchaser receives this 'standard warranty' by default. On request, an 'extended warranty' or 'customized project warranty' can be agreed after evaluation of the specific application conditions.
- Purchaser shall not rely on any other information or documentation.

7. Additional Conditions (non-exhaustive)

- This warranty is only valid for products sold in Europe. In other regions, other conditions may apply.
- The Products have been purchased directly from a Philips (sales) organisation.
- Proof of purchase for the Products is available for inspection by Philips.
- The Products have been properly installed and operated in accordance with the manufacturer's instructions.
- Adequate records of operating history are kept and available for inspection by Philips.
- A Philips representative will have access to the defective Products. If the Products or other parts become suspect, the representative shall have the right to invite other manufacturers' representatives to evaluate the lighting systems.
- Labour costs for (de)-installation of the Products are not covered under this warranty.

8. Limited Warranty

This warranty shall only apply to Philips branded lighting products sold by Philips Lighting in the territory of Europe (hereinafter referred to as 'Product'). The warranty is only applicable to the party purchasing the products directly from Philips (hereinafter referred to as: 'Purchaser').

Philips warrants that each Product will be free from defects in material and workmanship. The foregoing warranty shall be valid for the period mentioned in the applicable warranty policy for the Products referred to in your sales agreement. If a Product fails to operate in accordance with this warranty Philips will provide a free replacement of the failed Product subject to the applicable warranty policy and the limited warranty terms and conditions set out below.

9. Terms and Conditions

- Philips' warranty flows only to Purchaser. If any Product covered by this warranty is returned by Purchaser in accordance with section 3 and within the applicable warranty period set out in the warranty policy and on examination Philips determines to its satisfaction that such Product failed to satisfy this warranty, Philips will, at its option, repair or replace the Product or the defective part thereof, or reimburse Purchaser the purchase price. Unless otherwise agreed in writing within this document, for purposes of clarity, 'repair or replace the Product or the defective part thereof' does not include any removal or reinstallation activities, costs or expenses, including without limitation, labour costs or expenses.
- If Philips chooses to replace the Product and is not able to do so because it has been discontinued or is not available, Philips may refund the purchaser or replace the product with a comparable product (that can show small deviations in design and product specification).
- No agent, distributor or dealer is authorized to change, modify or extend the terms of the warranty on behalf of Philips.
- This warranty only applies when the Product has been properly wired and installed and operated within the electrical values, operating range and environmental conditions provided in the specifications, application guidelines, IEC standards or any other document accompanying the Products. If a Product is found to be defective, or not performing in accordance with the product specifications, the Purchaser must notify Philips in writing.
- Philips will facilitate the technical resolution of problems. Third party products sold by Philips are not covered under this warranty, except as indicated in section 5.
- This warranty does not apply to damage or failure to perform arising as a result of any Acts of God or from any abuse, misuse, abnormal use or use in violation of any applicable standard, code or instructions for use, including without limitation, those contained in the latest safety, industry and/or electrical standards for the relevant region(s).
- This warranty shall be void in the event any repairs or alterations, not duly authorized by Philips in writing, are made to the Product by any person. The manufacturing date of the product has to be clearly readable. Philips reserves the right to make the final decision on the validity of any warranty claim.
- If requested by Philips, the non-conforming or defective Products shall become Philips' property as soon as they have been replaced.

10. Warranty Claims

All warranty periods mentioned are subjected to a Philips representative having access to the Product or system for verification of non-compliance. Warranty claims have to be reported and returned to the local Philips office within 30 days after discovery, specifying at least the following information (additional information may be required on request):

- details of the failed Products; and for System warranties also details of other components used;

- installation date and invoice date;
- detailed problem description, number and % of failures date-code of failure;
- application, hours burned and number of switching cycles;

Where a warranty claim is justified, Philips will pay for freight expenses. Philips may charge Customer for returned Products that are not found to be defective or non-conforming together with the freight, testing and handling costs associated therewith.

11. No implied or other warranties

- The warranty and remedies contained in this warranty are the only warranties given by Philips with respect the Products and are given in lieu of all other warranties, whether express or implied, including without limitation warranties of merchantability or fitness for a particular purpose, which warranties are hereby disclaimed.
- These terms and conditions state Philips' entire liability and obligation to Purchaser and Purchaser's sole and exclusive remedy in connection with defective or non-conforming Products supplied by Philips to Customer, whether or not such damages are based on any warranty not explicitly mentioned in these terms and conditions, tort contract or any other legal theory, even if Philips has been advised or is aware of such defects.

12. Limitations and conditions

- This is a limited warranty and excludes, among other items, providing access to products (scaffolding, lifts, etc.), and special, incidental and consequential damages (such as loss of revenue/profits, damage to property or other miscellaneous costs not previously mentioned), and is further defined by the limitations and conditions set forth in the respective warranty policy and these terms and conditions.
- Upon request, Philips' representatives shall be allowed access to the defective Product, system or application for verification of non-compliance.
- Philips cannot be held liable for electrical supply conditions, including supply spikes, over-voltage/under-voltage and Ripple Current control systems that are beyond the specified limits of the products and those defined by relevant supply standards (e.g. EN 50160 norms).
- With respect to products sold to the Purchaser by Philips, but not bearing the Philips name or sub-brands, Philips makes no warranty of any kind, express or implied, including, without limitation, any warranty of merchantability or fitness for a particular purpose, but will make available to the Purchaser upon request, but only to the extent permitted by law and relevant contracts, the warranties of the manufacturer of the relevant product.

Signatures

This offer is made by Philips Lighting on 9. November, 2016.

Signature:

Name: [AUTHORIZED SIGNING PERSON]

Company: [LOCAL LEGAL ENTITY]

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