


TAKING  
**COOPERATION**  
FORWARD

 Bosco Virgiliano Pilot Area (6<sup>th</sup> March 2018 Update)

 **“BIO-DYNAMIC LIGHT” IMPLANT OVERVIEW + COSTS**

 PP06 - Tea S.p.A. (Mantova, Italy)

# TERRITORIAL CONTEXT



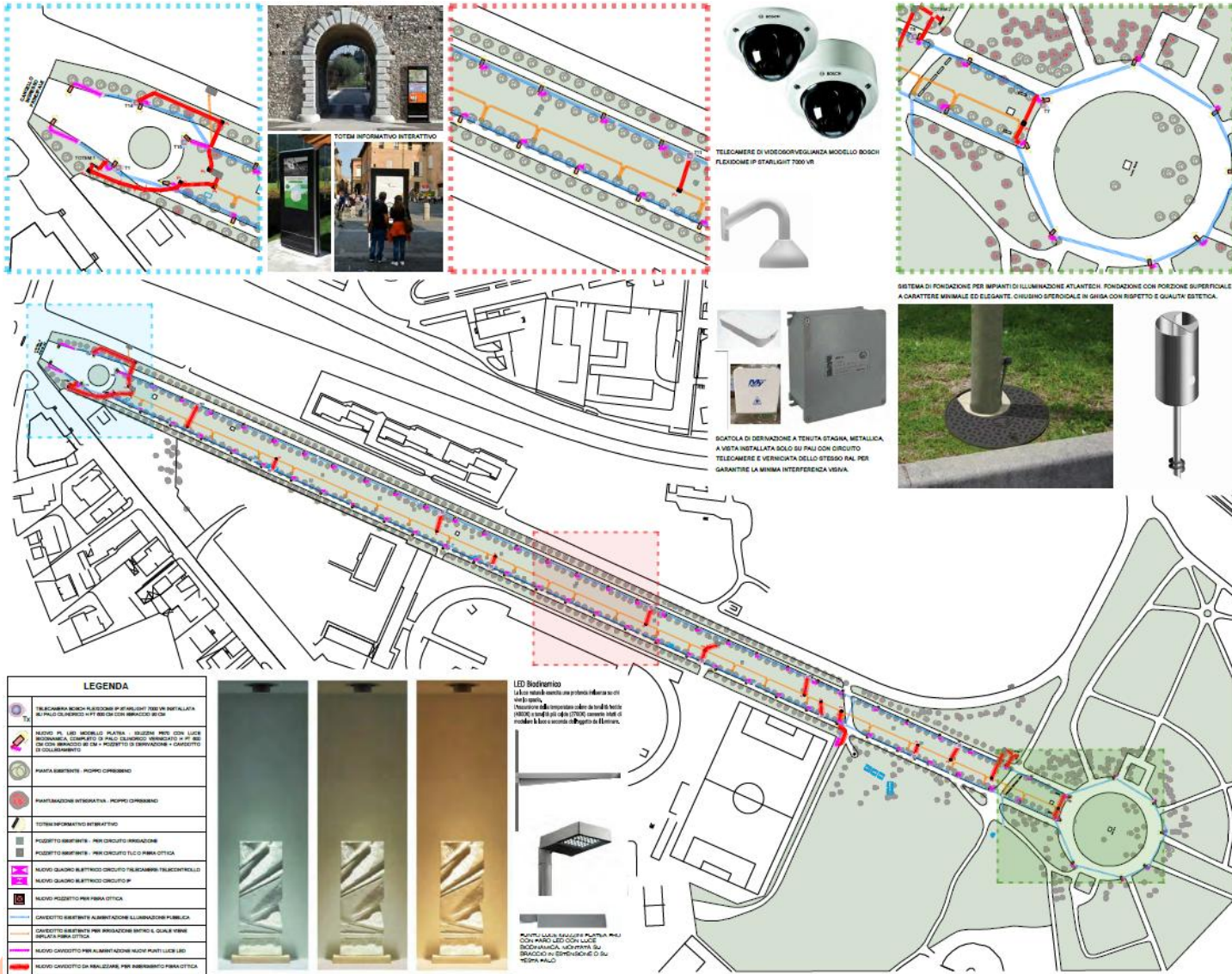


# PILOT AREA > BOSCO VIRGILIANO





# PROJECT LAYOUT



  
**COMUNE DI MANTOVA**  
Provincia di Mantova

**Comune Spese**  
**TEA SPA**  
Via TA. BUCI, 3 - 41010 MANTOVA

**Lavoro**  
INTERVENTO PER LA REGOLAZIONE DELL'ILLUMINAZIONE PUBBLICA DI BOSCO VIRGILIANO TRAMITE UTILIZZO DI TECNOLOGIE CON SENSIBILIZZAZIONE BIOMIMETICA, NELL'AMBITO DEL PROGETTO DYNAMIC LIGHT

  
CE452

**Ubicazione**  
**BOSCO VIRGILIANO**  
STRADA BOSCO VIRGILIANO - 41010 MANTOVA

**Tecnica**  
PROGETTISTA ARCHITETTONICO-PANORAMICO  
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PROGETTISTA IMPIANTISTICO  
CP. PIAZZA SAN GIOVANNI BOSCO E  
RESTAURI PROGETTI  
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P.IVA 0289702020

COORDINATORE DELLA SICUREZZA  
Sereni IOTTI PAOLO AUGUSTO  
CP. PIAZZA SAN GIOVANNI BOSCO E  
Via Francesco Marconi 20  
42017 Novara (PC)

**Titolo Tavola**  
**PROG. ARCHITETTONICO**  
PROGETTO DIMENSIONI DELLE PIANTAZIONI INTEGRATIVE E QUALITÀ IMPIANTI DI ILLUMINAZIONE E IRRADIAZIONE PER LA PRIMA OTTICA  
TELECAMERE  
RICERCAZIONE DELLE TIPOLOGIE DI PRODOTTO DA INSTALLARE

**Scala visiva**  
GENERALE 1:1.000  
DETTAGLIO 1:500

**N. Tavola**  
**t.02**

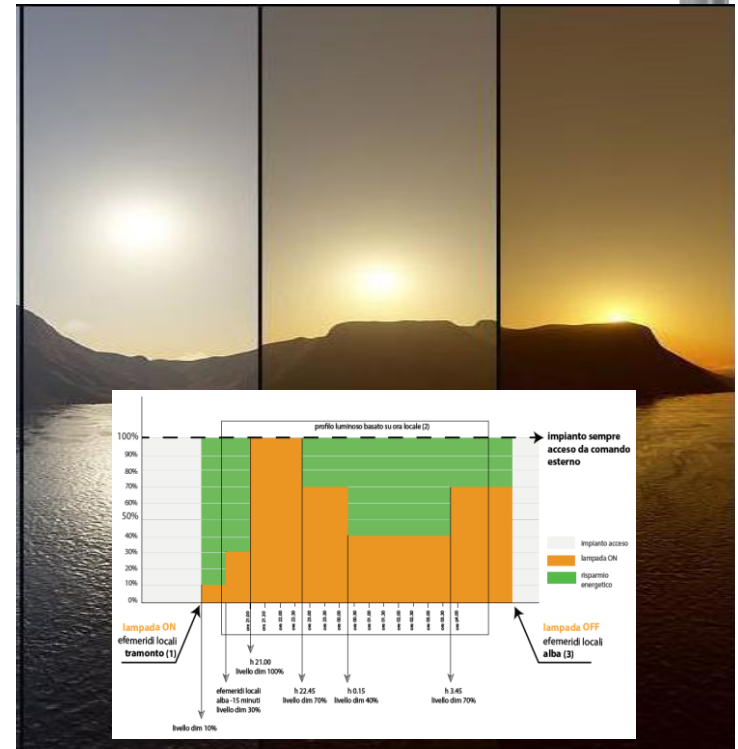
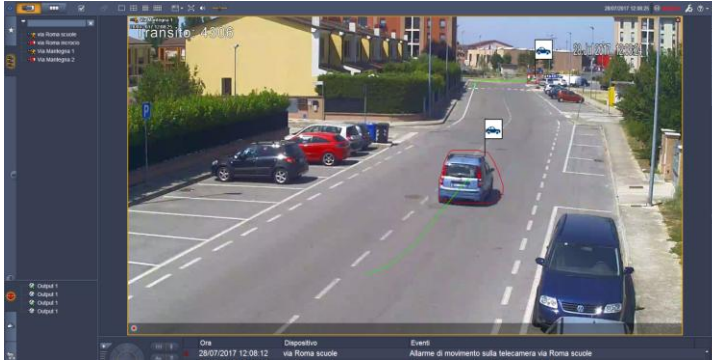


# LOGICAL WORKFLOW

INTELLIGENT  
VIDEO ANALYTICS



BIO-DIMMING  
4000K ÷ 2700K



Optical  
Fiber



PLT

TAKING COOPERATION FORWARD

## N. 15 VIDEOCAMERAS equipped with “Intelligent Video Analytics” (Bosch)

The integrated image detection system captures the user presence and behavior as metadata and send it to an industrial PC on the concentrator unit, where a dedicated software will manage the light dimming operations depending on it.



- ▶ Prestazioni eccellenti in condizioni di scarsa illuminazione
- ▶ Intelligent Video Analytics integrata per attivare gli allarmi di interesse e recuperare rapidamente i dati
- ▶ Intelligent Dynamic Noise Reduction, in grado di ridurre la banda ed i requisiti di memorizzazione fino al 50%
- ▶ La modalità gamma dinamica estesa permette la visualizzazione dei dettagli sia nelle aree fortemente illuminate sia nelle aree buie
- ▶ Semplice da installare grazie all'obiettivo SR con zoom e messa a fuoco automatici e le modalità video preconfigurate



## OPTICAL FIBER NETWORK EXTENSION (MNet)

3500m of optical microcable and related accessories for videocameras-concentrator-PC connection.

Fibre Wall Outlets are easy-to-install, simple, compact, neat and elegant design devices suitable to end the optical networks at users' side. Each different outlet from Optotec suit all environments and can be installed in a fast and easy way anywhere in the apartment or in the office.  
Pigtails, adapters, splice protectors, and any accessory needed are available to complete the installation. Please contact our sales representative to select the best outlet option tailored on your needs (fibre termination capacity, cable entrances and fixing, etc.).



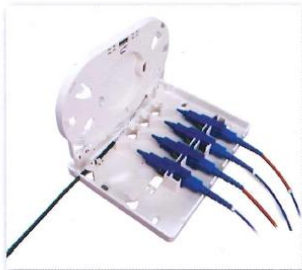
FW01



FW02



FW03



FW04



FW05

### MB - MICROCAVO




Cavo per posa con sistema Air-Blow, destinato all'installazione in microtubi sia in rete di lunga distanza che in rete di accesso MAN (Metropolitan Area Network), limitando scavi e rotture del manto stradale.

Dimensioni e peso sono ridotti al minimo per facilitare il soffaggio all'interno dei condotti.

#### Caratteristiche standard:

- Struttura a tubetti tamponati (loose tube) fino a 24 fibre per ogni tubetto
- Potenzialità fino a 288 fibre ottiche
- Guaina esterna a basso coefficiente d'attrito

#### Caratteristiche di impiego e posa:

-  10km
-  -20° -+60°
-  500m



## EMBEDDED SOFTWARE-EQUIPPED INDUSTRIAL PC (Bosch/Alesys feat. AP Systems)

Development of a dedicated software, installed on specific hardware device, for light bodies dimming control through the elaboration of videocameras metadata.

# SPC-3500 Series

6th Gen Intel® Core™ i7/ i5/ i3 U-series Processor (Skylake-U) Ultra-compact Fanless Embedded Box PC, 4 Gigabit LAN, 2 SSD, 1 SIM, 4 USB 3.0, 9 COM, 16 Isolated DIO, -40°C to 85°C, Rugged, High Performance, Extended Temperature



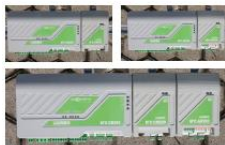


# INVOLVED TECHNOLOGY 4/7

## LIGHT MANAGER CONCENTRATOR UNITS AND REMOTE POINT-TO-POINT CONTROL NODES (AP Systems) Remote management of light bodies schemes via “Power Line” communication technology.

The ultimate solution for the remote management of smart city schemes.  
M<sup>3</sup>C-CB200 remotely manages and controls the electrical cabinet itself and any single lampset via powerline communication. Thanks to the integrated I/O interface the light manager can program the switch on and off of the plants by using the integrated astronomical clock, retrieve status, failure and electrical measurements.  
The powerline communication module allows communication among any single lampset and smart city sensors installed on the address.  
M<sup>3</sup>C-CB200 can be used for point-to-point management or even just for the remote management of the electrical cabinet.  
It's the most flexible and smart choice of its kind!

### M<sup>3</sup>C-CB200 THE LINUX BASED SMART LIGHTING DATA CONCENTRATOR



	CPU
processor performance	ARM9 33Mhz
operating system	386 MIPS
RAM	Linux embedded
mass storage	256 Mbytes
real time clock	256 Mbytes (NAND type memory)
	astronomical clock management included



### M<sup>3</sup>-PLN/5-Lx

REMOTE POINT-TO-POINT MANAGEMENT  
LUMINIBUS LIGHT SERIES FOR LED STREETLAMPS

The M<sup>3</sup>-PLN/5-Lx nodes serie allow point-to-point remote management of LED streetlamps with power up to 150W. Used in a remote managing system, M<sup>3</sup>-PLN/5-Lx transforms a single streetlamp into a network node able to switch on/off, dim the lamp and communicate to a the control room its operating status, its own diagnostic values, its own consumptions and electrical measurements. The streetlamp equipped with M<sup>3</sup>-PLN/5-Lx operates according to the provided luminous plan; it can operate both applying the pre-set luminous flux (transition mode) or by executing instructions received from the control room. Its powerline communication (PLC), through the concentrator unit installed in the electrical panel. Data communication among M<sup>3</sup>-PLN/5-Lx nodes and the M<sup>3</sup>-CB40 concentrators serie is performed via PLC mode using the MeteringMore standard open protocol. The use of open communication protocols in a street lighting remote management system, ensures not only high reliability and operating continuity over time but also the maximum expandability towards "smart city" and "smart metering" applications (i.e. electric, gas and water meters metering systems). M<sup>3</sup>-PLN/5-Lx is available as IP67 version to be installed in the pole base and as IP20 version to be installed inside the streetlamp fixtures.



ap systems  
30 smart technologies  
meters more



# INVOLVED TECHNOLOGY 5/7

## “FULL CUT-OFF” & “BIO-DYNAMIC” LED LIGHT BODIES (iGuzzini)

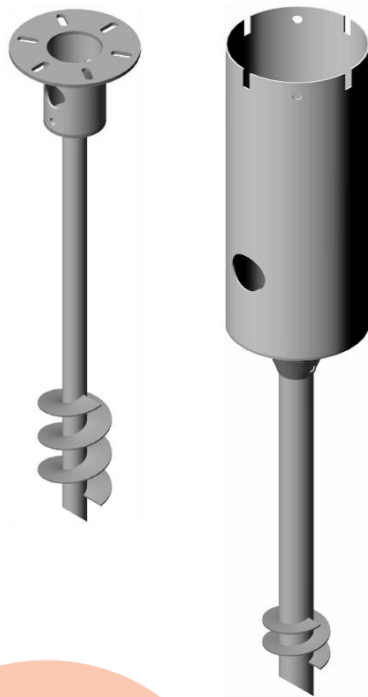
Adaptive LED (Light-Emitting Diode) technology light sources, dimming depending on user types (videocameras metadata and software configuration) and ranging their color temperature from 2700K to 4000K. “Platea Pro” model (installed both head-top and on arms).





## “SCREW” FOUNDATIONS SYSTEM (Atlantech/Pali Campion)

Innovative and patented screw-shaped foundations solution, made of hot dip galvanized steel, for poles and totem. It allows concrete elimination, fast installation, low environmental and visual impact, as well as being easy to recycle.



before...



...after



# INVOLVED TECHNOLOGY 7/7

## MULTIMEDIA TOUCHSCREEN TOTEM (Aesys)

N. 2 interactive totem, installed at park's entrance points and with integrated Wi-Fi hotspots.





# LIGHTING OPERATING CONCEPT

- Entrances (the two roundabouts at area's limits)

Permanent 100% luminous flux, 4000K color temperature

Exceptions: dimming in compliance with Regional Law (-30% from 11 PM in Winter season; -30% from 12 AM in Summer season)

- Cycle-Pedestrian Paths

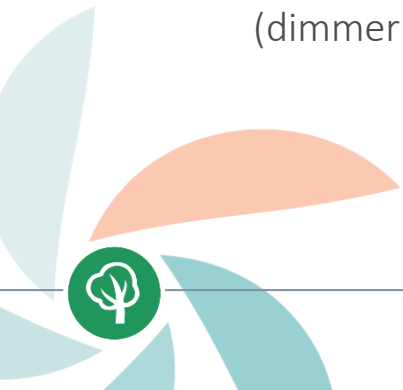
Users Absence

10÷20% of maximum luminous flux (visual guide), 2700K color temperature

Users Presence

*Pedestrians and Runners:* 50% of maximum luminous flux, 4000K color temperature (dimming timing to be evaluated during tuning period following the installation)

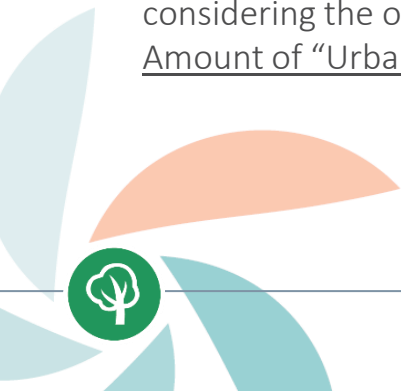
*Cyclists/rescue vehicles/service vehicles:* 100% luminous flux, 4000K color temperature (dimming timing to be evaluated during tuning period following the installation)



# TECHNICAL DETAILS

	LIGHT BODY				IMPLANT				
	Light Source	Power [W]	Luminous Flux [lm]	Luminous Efficiency [lm/W]	Light Sources Number	CCTV	Average Illuminance [lux]	Illuminance Uniformity (min/med)	Total Power [kW]
<b>BEFORE</b>	HPS (High Pressure Sodium) Globes	100	8100	81	56 (on 28 poles)	-	1,47	0,10	7,00
<b>AFTER</b>	“Full Cut-Off” & “Bio-Dynamic” (2700K÷4000K) LED (Light-Emitting Diode)	30,8÷87,6	3600÷12600	118÷144	74 (on 74 poles)	15 Image Detection Cameras (10 on dedicated poles)	10,20 (2700K) 17,30 (4000K)	0,41 (2700K) 0,41 (4000K)	2,60

Estimated energy saving (Revamping + Dynamic): ~65%,  
 considering the operating outline determined by AEEGSI (4.196 average annual hours)  
Amount of “Urban Sky Glow” < 0,49 cd/Klm





# GENERAL COSTS

	Company	Products/Services Description	Cost [€]
<i>PRODUCTS</i>	iGuzzini Illuminazione S.p.A.	Supply of n. 74 "Platea Pro" Light Bodies and accessories	40.000
	Bosch Sicherheitssysteme GmbH	Supply and installation support of n. 15 Intelligent Videocameras + "Dynamic" Control Software development and configuration	15.300
	Pali Campion S.r.l.	Supply and installation of n. 88 "Screw" Foundations and n. 84 Poles	34.600
	A.P. Systems S.r.l.	Supply and installation support of "Luminibus" light dimming management and remote point-to-point control systems through power line technology	6.400
	MNet S.r.l.	Supply and installation of Optical Fiber network extension (3.500m optical microcable)	26.200
	Aesys S.p.A.	Supply and installation support of n. 2 Touchscreen Multimedia Totem	26.000
<i>SERVICES</i>	Forcellini & Giovannoni Architectural Firm	Documentation for the Landscape Authorization; Documentation for the Monumental Authorization of Government Department Responsible for Architectural and Landscape Heritage; Documentation for the S.C.I.A. ("Certified Report of Activity Start", B1 Form) to be addressed to Mantova Municipality	3.800
	Restart Progetti	Executive Planning, Works Direction, Security Coordination during works design and execution phase	10.500
	Mantova Ambiente S.r.l.	Building Site works and Technical Support	17.400
	TEA Reteluce S.r.l.	Technical Consulting and installation of new "Bio-Dynamic" lighting technology.	19.500
		<i>Tot.</i>	~ 199.700

