

CASES
017**Prototypes Doosan Bobcat can move earth as much as they like**

Always perfect light, no matter the height

Testing activities at the Doosan Bobcat testing facility commence day and night and the landscape differs every day. What is a hill today, can be a pit tomorrow. Doosan Bobcat selected AAA-LUX LED luminaires to illuminate the area. The wireless and flexible controls of AAA-LUX LED luminaires always provide sufficient light on the ground no matter what distance.

Doosan Bobcat earthmoving equipment has a reputation of being 'durable and dependable', a reputation earned by designing and manufacturing quality earthmoving equipments for the past 50 odd years. All activities in Europe are managed from its European headquarters located in Dobris, Czech Republic. Apart from producing

loaders, excavators and telescopic handlers, they also design and construct the next generation heavy duty earthmoving equipment at this facility. All prototypes that are designed by Bobcat Engineering, the Research and Development department of Doosan Bobcat, are subjected to an extensive testing program before they are introduced to the market. The prototypes are tested with full loading for their entire functional working hours to ensure high quality and endurance for which Doosan Bobcat equipment are known for.

In order to do so the company has its own testing facility. Hidden in the hills nearby is a 57 000m² testing facility where all vehicles are tested to determine the quality, strength and durability of the design. As the company decided in autumn 2014 to extend the test

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program into the night, it was decided to also invest in illumination for the testing facility. Safety of the equipment and employees at the testing facility was paramount to Doosan Bobcat hence the company

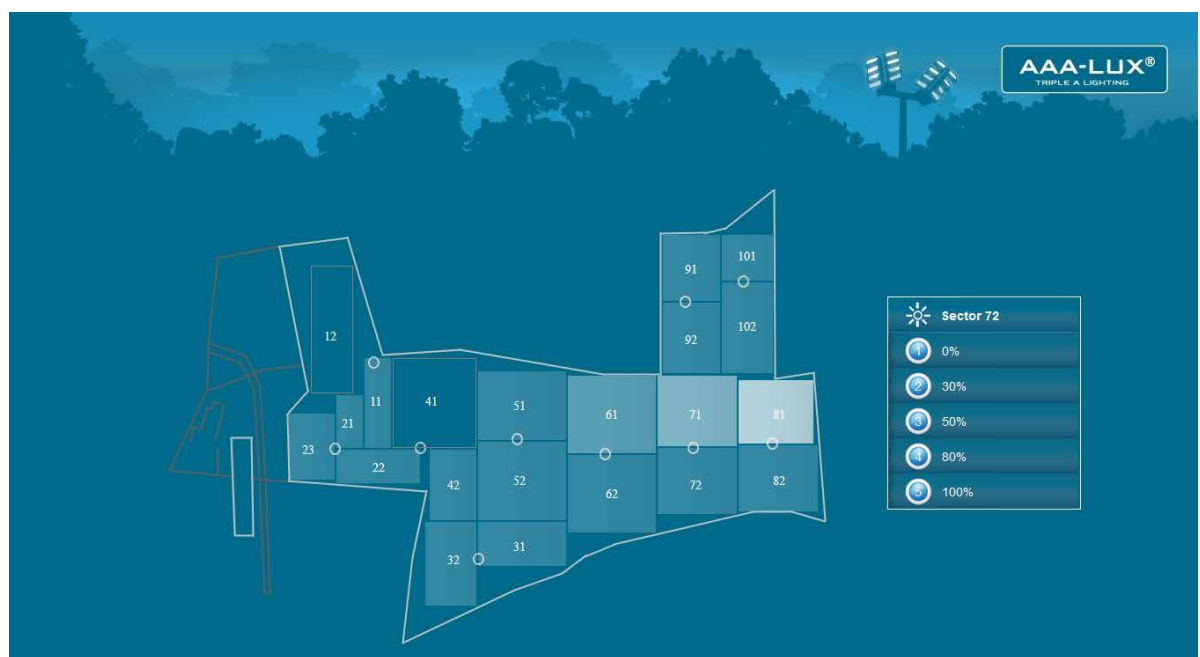
'Each luminaire can be controlled individually and the Lighting Control Management System allows for adjusting the illumination levels to always ensure the 25Lx with a uniformity of $E_{min}/E_{ave}=0,4$ as the client required'

embarked on a quest to find the best possible solution for illuminating the area. Czech illumination specialist Abatec was asked to provide some guidance. 'Illuminating 57 000m2 on a slope is a challenge,' says Ludek Mechura from Abatec. 'The fact that the landscape changes every day, due to the continuous displacement of earth by vehicles that are being tested, made it even more challenging,' he adds. 'The quality of illumination is always determined by the illumination quality measured on the ground. It is important that the correct luminaire is selected. Over and above the degeneration of light while travelling, elements like the quality of the LED's used or the transparency of the glass plate that protects the luminaire also impact the quality of light that is emitted. When those components are not of good quality they can reduce the volume of light that makes it to the ground by 20%.' Abatec offered Doosan Bobcat three different solutions. 'Our different proposals consisted of floodlights with sodium lamp, metal-halide lamps

and LED floodlights.' Impressed by the strong financial business case, Doosan Bobcat selected the LED luminaires from AAA-LUX. 'The proven track record in LED technology, dating back to 2009 was a very important aspect in convincing Doosan Bobcat to select LED luminaires from AAA-LUX. They also valued the focus on innovation AAA-LUX has; as well as the fact that their LED luminaires have been proven time and time again for being of the highest quality. AAA-LUX luminaires manage to do so as all essential components for the luminaires are produced in-house.'

Flexible advantage

The selection of AAA-LUX LED luminaires will generate significant savings for Doosan Bobcat in the coming years. The innovative illumination technology, however, also provides another advantage. 'Each luminaire can be controlled individually and their Lighting Control Management System (LCMS) allows for adjusting the illumination levels to always ensure the 25Lx with a uniformity of $E_{min}/E_{ave}=0,4$ as the client required,' Mechura continues. 'Never mind where soil is added or removed; the illumination strength is adjusted at the luminaire to guarantee the illumination quality at the ground.' The luminaires at the testing facility of Doosan Bobcat are controlled by means of a Touchscreen and Control Box. 'Each luminaire is part of a MESH network, meaning that each luminaire can be used to relay instructions to the other. Thanks to this network controls, the LED luminaires can be placed further away from the site. It also has no limitations in terms of the luminaire that is positioned the furthest away from the controls as the data that needs to be communicated, won't get lost.'



The light of the luminaires also doesn't interfere with the activities taking place on the ground. 'On first stage Doosan Bobcat opted to control each LED floodlight individually. They can do so by selecting one of the five lighting levels they have at their disposal; 0%, 30%, 50%, 80% and 100%. This will minimize glare in the eyes of the drivers, something that normally would happen with conventional floodlights when machines are tested in climbing uphill, or going downhill on-site.'

No interference

Information to the AAA-LUX LED luminaires is communicated wirelessly, as is the information Doosan Bobcat retrieves from the various prototypes that are being tested at the testing facility. Nevertheless, the luminaires and their controls do not interfere with the wireless communication of other operations. 'Not at all,' Mechura states. 'The software AAA-LUX uses has

been developed by dedicated software designers at AAA-LUX themselves. It is based on technology used in the military and aircraft industry; two industries that

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require the highest level of quality and security possible for software. AAA-LUX uses a proprietary base-layer for their software and has added the unique AAA-LUX features to this protocol. The system is absolute safe and does not interfere with any other remotely controlled activity in the area. It is also impossible to hack into this system.'

Investment worth it

The investment Doosan Bobcat made in illumination for its testing facility has clearly paid off. 'The site now operates 24 hours a day during week days. This allows Doosan Bobcat to collect feedback on their prototypes much faster and the feedback is also more adequate. The improved illumination enables the operators of the machines to take them to greater heights without having to wonder whether they will be at risk.' It has also clearly contributed to the safety on-site. 'The illumination quality of AAA-LUX LED luminaires matches that of daylight. People also experience it as being a much more stable light that increases visibility.' Thanks to the improved illumination, operators at the Doosan Bobcat test facility are better able to detect movements at night and to distinguish what is happening or where they are going. 'As they themselves don't know what the layout of the test facility is like when they arrive for their shift, it is very important that they have good visibility for them to have clear view of their path and possible dangers. Doosan Bobcat earthmoving equipment might have been designed to be durable and dependable; there is no need to establish that while the driver is inside the vehicle.'



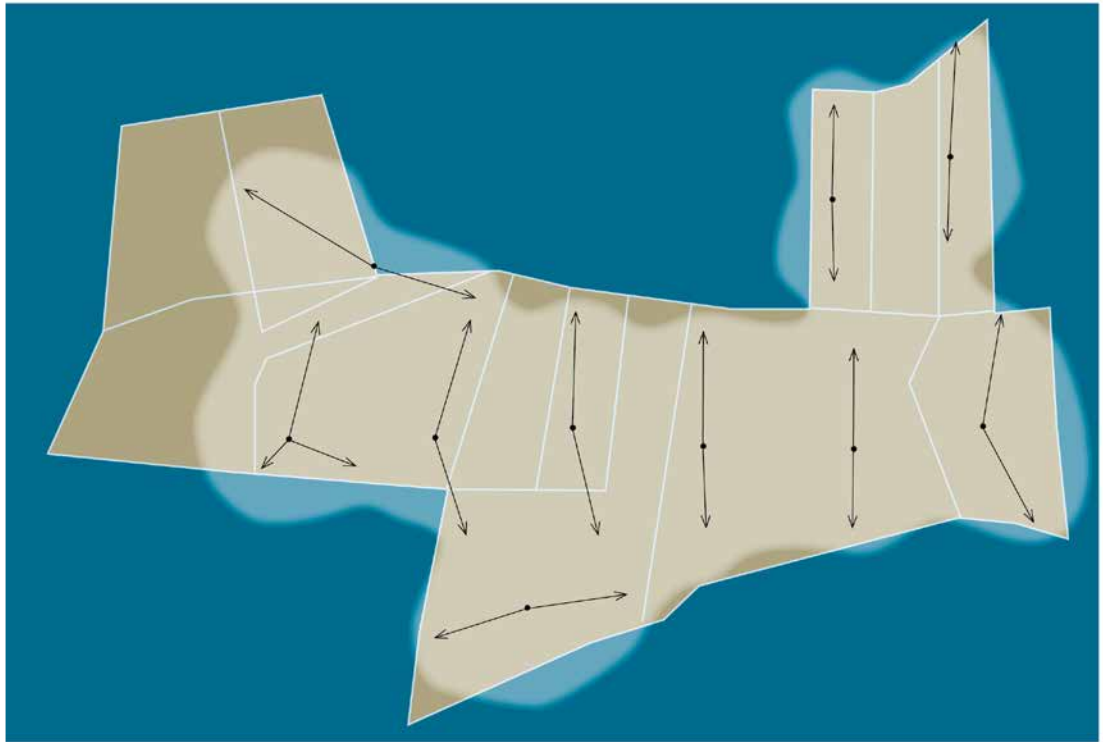
Bobcat Company

Bobcat Company, a subsidiary of Doosan Bobcat Inc., leads the industry in the design, manufacture, marketing and distribution of compact equipment for construction, rental, landscaping, agriculture, grounds maintenance, government, utility, industry and mining. They strive to empower their customers to do their jobs more efficiently and effectively.

The renowned Bobcat brand is synonymous with durability and dependability. Tough, versatile, agile Bobcat® equipment, with its time-tested reliability has rightfully earned the nickname "One Tough Animal."

Doosan Bobcat installation details

Lightplan
example



Led Luminaires
used



21 x **AL 180**

AL 180
SERIES



More information:
<http://www.aaa-lux-lighting.com/products/al-serie-luminaires/>

LCMS



Switchbox and Touchscreen



More information:
<http://www.aaa-lux-lighting.com/products/lcms/>



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