more than 25 Years

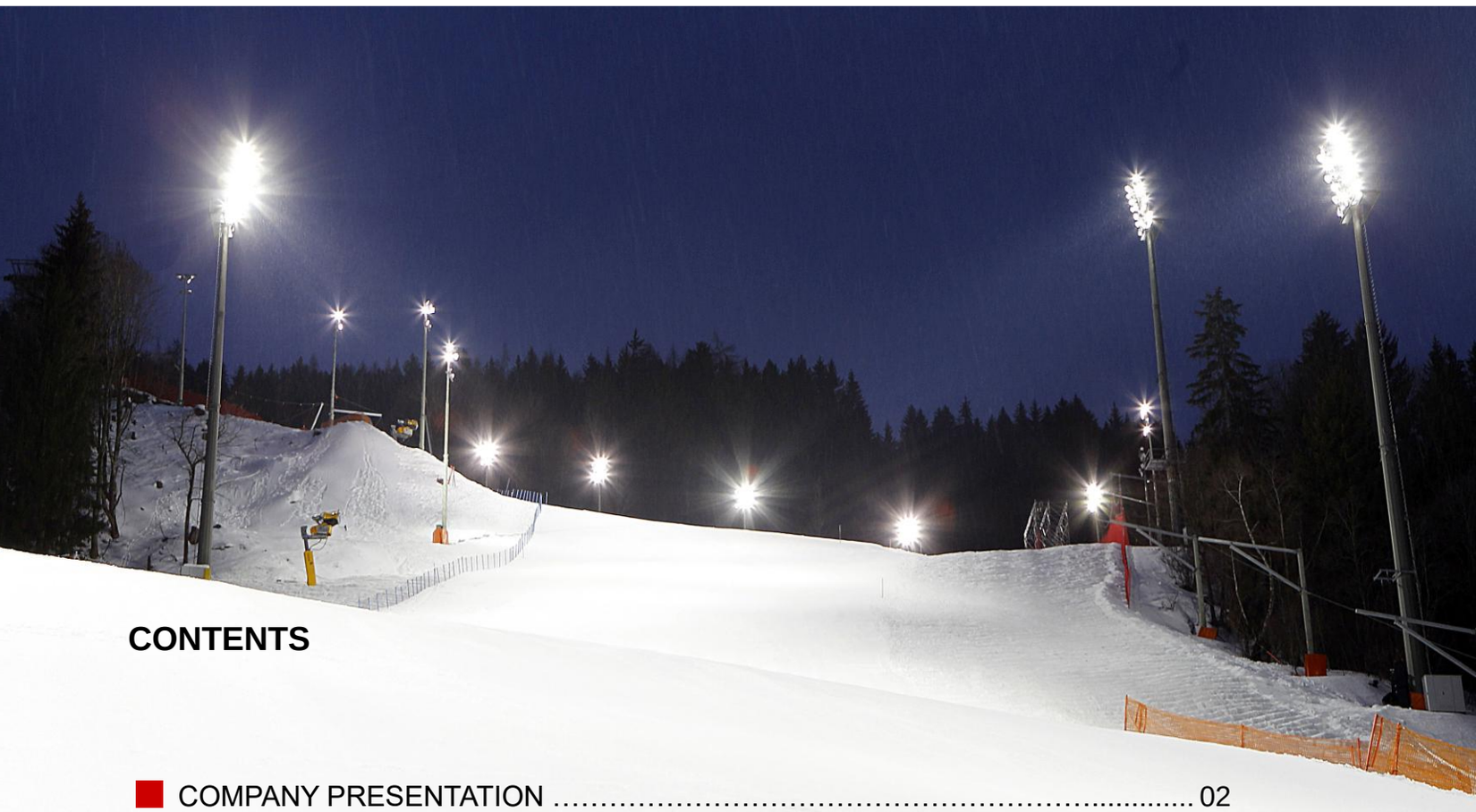
STICH®

Professional floodlighting solutions

Floodlighting Winter

AUSTRIA SURPRISINGLY INGENIOUS

www.flutlichtanlagen.at



CONTENTS

THE COMPANY

The ***STICH®*** company has been focusing on providing innovative and efficient lighting solutions for halls, football and American football pitches, tennis courts, stadiums, arenas, ski pistes, toboggan runs and campsites etc. for the last 25 years.

Experience gained from over 800 installed systems across Europe and Asia is invested into each new project.

As a licensed electrical company, ***STICH®*** covers the planning, assembly, installation and maintenance of the electrical systems.

STICH® operates on the Austrian market as a general representative of the companies Tecnoclima and Tecnopali. Since 2005, it has also operated a lighting technology cooperation agreement with Philips.

High quality lighting technology paired with the commitment of qualified members of staff guarantee the client innovative and economic lighting solutions.

Innovative and energy-efficient LED technology is also being used.
Thanks to these future-oriented lighting solutions, all customer requirements are covered.

INTRODUCTORY QUESTIONS & ANSWERS

General

Floodlighting in Winter is determined by the type of sport and direct environment in which it is being practised. Another factor is the type of performance or purpose of the event, e.g. public race, training session, competition or standards for TV broadcast.

The performance ability of the floodlighting is defined: good visibility requires tailored lighting. This applies in particular to outdoor sports areas. Here, the strength and evenness of the lighting, the glare limitation and colour properties of the light sources must meet with the light standards specified in European standard ON EN 12193 on 'lighting at sports sites. Here, the requirements for lighting the most practised sports are defined and should be seen as minimum values, thereby making the task of lighting such sites even more challenging.

To fully accommodate the diverse functionality of such sites, the lighting requirements extend beyond standard sports guidelines. The floodlighting system must also be cost-effective and meet long-term operational needs.

Masts

The mast height and distance varies according to the area of use. When it comes to public races and competitions, it is usually sufficient to light the piste from one side. The mast height should be approx. 16-18 m and the mast distance approx. 40–50 m. Snow canons are usually already installed and in this case, the electrical supply can be obtained from the existing supply units. Sites to be broadcast on TV require a medium lighting strength of 1200 Lx, and in this case mast heights up to 30 m and up to 25 floodlights per mast are required.

INTRODUCTORY QUESTIONS & ANSWERS

White light – Metal halide lamps

The light source used, with a corresponding colour spectrum, is crucial for colour rendering. According to the Austrian Ski Association (ÖSV), competitions should take place under conditions which resemble daylight and therefore metal halide lamps are used in this case. The light yield is approx. 120,000 Lm from a 1000W output.

Yellow light – Sodium discharge lamps

Yellow light is often required for nature protection purposes. The blue part of the colour spectrum is lower and therefore the light source can barely be perceived by insects. The light yield is approx. 135,000 Lm from a 1000W output.

Horizontal illumination

The evenness of the lighting is perceptible in direct relation to contrast and shade. Landforms such as edges and troughs must be perceptible from afar through differences in contrast.

Vertical illumination

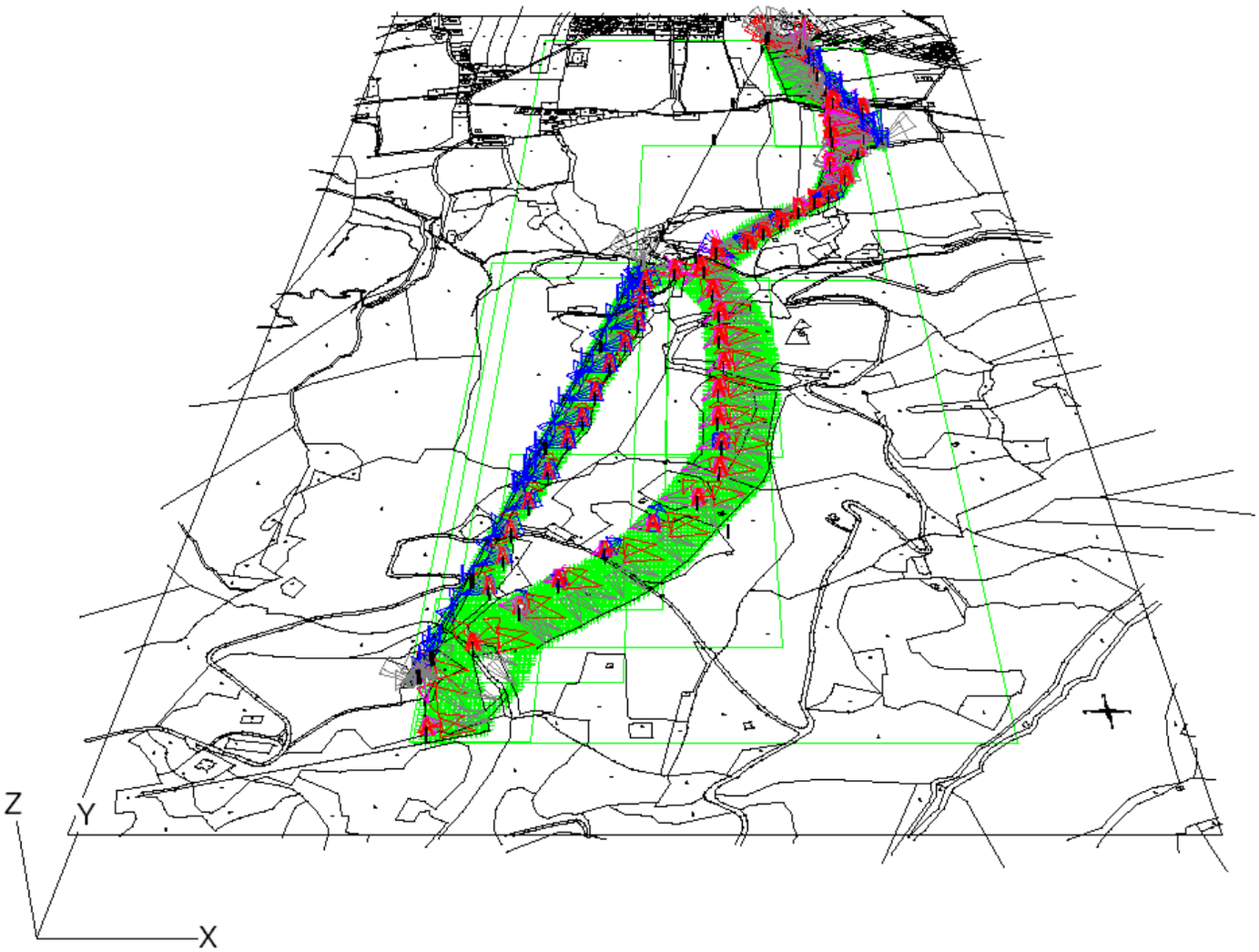
Lighting on a vertical surface forms the basis for lighting requirements relating to colour TV and film recordings. The required height is dependent on the speed of the sport, the focusing distance and the camera angle. Since the illuminated area forms a key part of the field of observation for the camera, it is important to have a sufficient amount of vertical illumination present.

Glare limitation

Glare reduces ability to see and can be avoided or reduced to a minimum by thorough planning.

PLANNING PROCESS FOR A FLOODLIGHTING SYSTEM

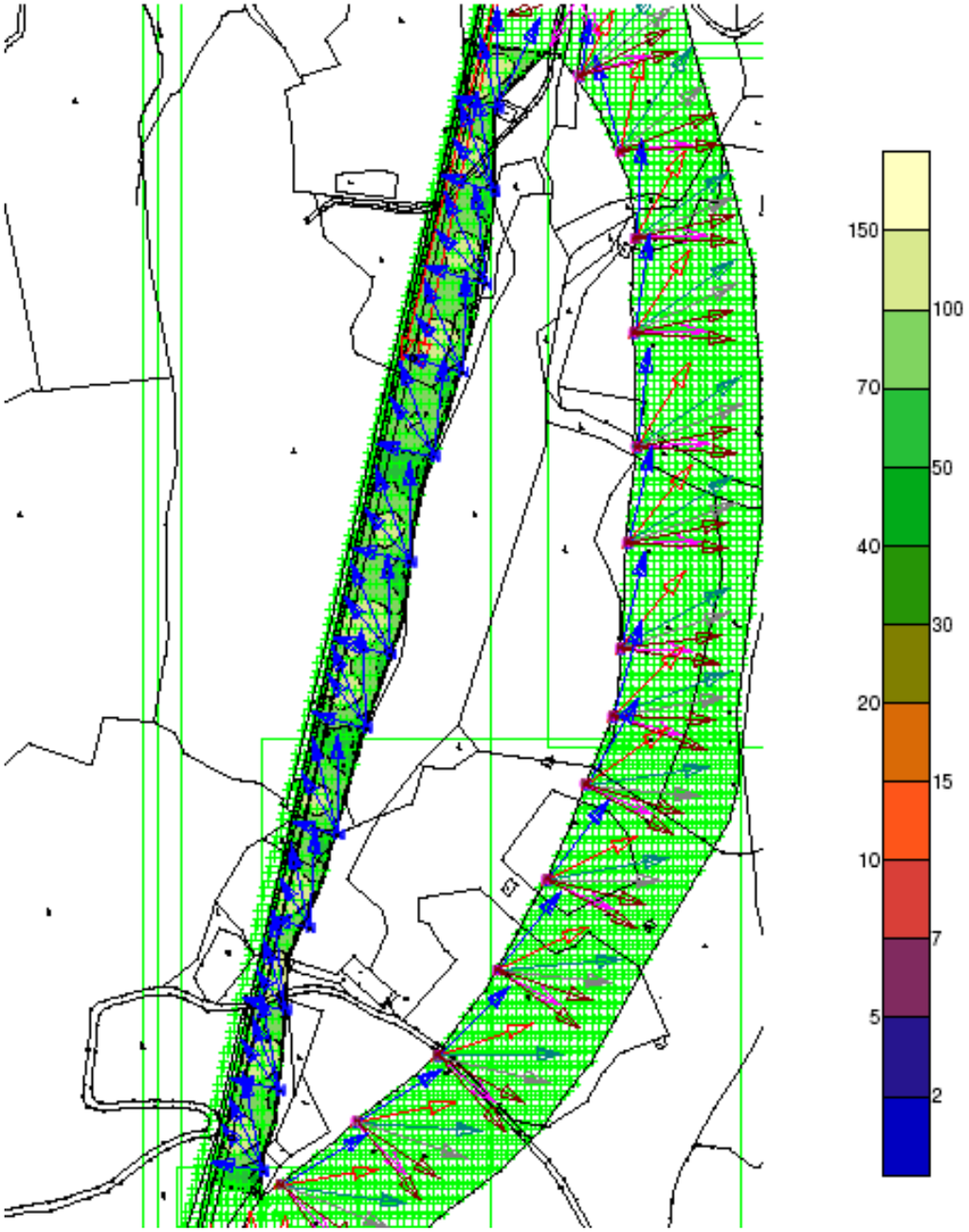
Floodlighting systems in line with the latest technology need to meet the technical lighting specifications and be economic, given the rising energy costs. This can only be guaranteed through competent planning with specific lighting calculations which include all of the local parameters.



Planning example – ski slope

PLANNING PROCESS FOR A FLOODLIGHTING SYSTEM

Map view of route section, number and direction of floodlights



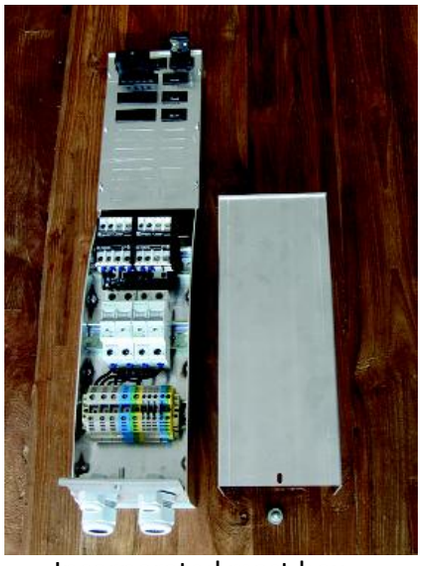
Planning example – ski slope

MASTS – MAST INSTALLATION
FOR FLOODLIGHTING SYSTEMS OF UP TO 20M MOUNTING HEIGHT

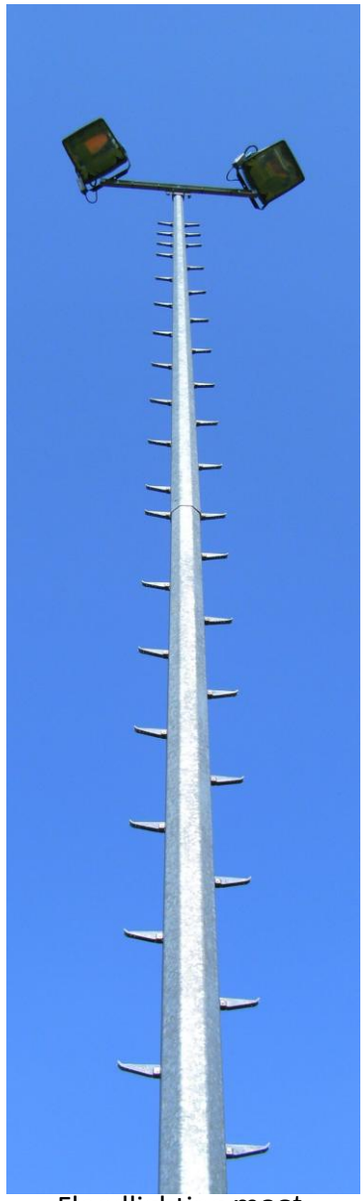
Conical 8-edged floodlighting masts, delivered in 2 parts, are put together on-site. Climbing steps and cross-bars for mounting the floodlights are attached and there is also the option of attaching a fall protection rope. The masts come with 2 cable entry points in the mast base as standard, 0.5 m below the upper edge of the foundations. The number of mast doors varies depending on the allocation of spotlights on the cross-bars. The necessary operating devices can be incorporated within the mast or installed in mast boxes on or alongside the floodlighting mast. In addition to the standard programme, special masts can also be colour-coated on request or supplied with a flange plate in the requested design.

Attached mast boxes
with operating devices

Capacitor box



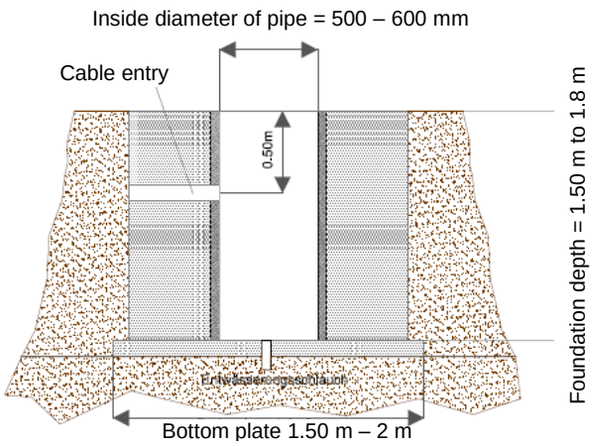
Incorporated mast box



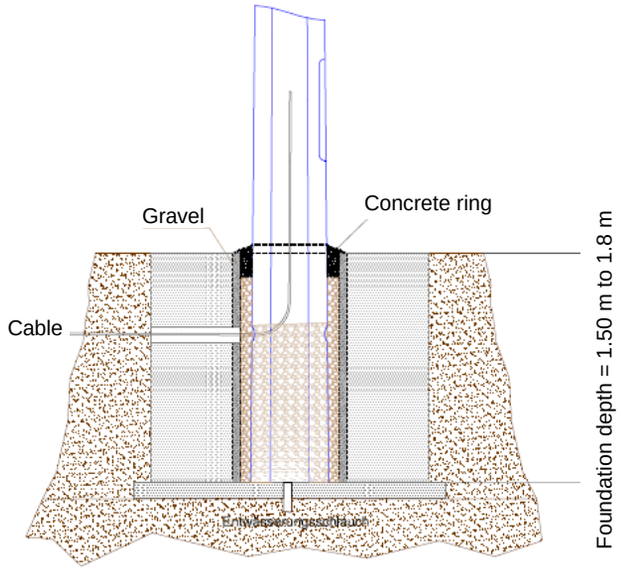
Floodlighting mast

MAST FOUNDATIONS AND CABLE LAYING

The masts are supplied with sample statics which serve the construction company in question as a basis for their statistical calculations. Base compression and wind load are specified and the masts can be adapted until these values are reached. The foundation sites are established with the client, in line with the technical lighting calculations. This mostly relates to sleeve foundations where the mast base should be inserted 1.5 m – 1.8 m into the foundations.



UNFINISHED FOUNDATION



FOUNDATION WITH OFFSET MAST

The foundation measurements vary from 1.6m x 1.6m x 1.6m to approx. 2.0m x 2.0m x 2.0m with standard base compression. The foundations should be increased in the event of the ground having a lower load-bearing capacity or there being a higher wind load.
The masts are positioned using mobile cranes, which lift them into the sleeve foundations. Once in place, the masts are secured by filling the gaps with loose chippings of 4-8 mm grain size, which are then compacted.

TYPES OF FOUNDATIONS

During system maintenance, the gap between the mast and foundation is filled with concrete to a height of approximately 10 cm on-site. This concrete ring forms a seal, securely anchoring the mast and preventing any movement. If removal of the mast is required, the concrete ring can be easily removed, allowing for the mast to be withdrawn without difficulty. The underground cable should be installed in trenches approximately 70 cm deep, with a sand bed beneath. A layer of earth and cable warning tape is then placed about 25 cm above the cable. We provide a detailed cable laying plan to ensure proper installation.

Square foundations

Foundations with anchor basket

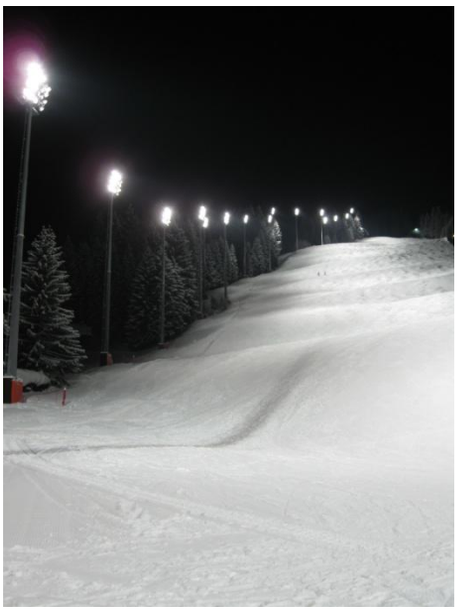
Round foundations

Foundations

FULL HD-TV SUITABLE FLOODLIGHTING SYSTEMS

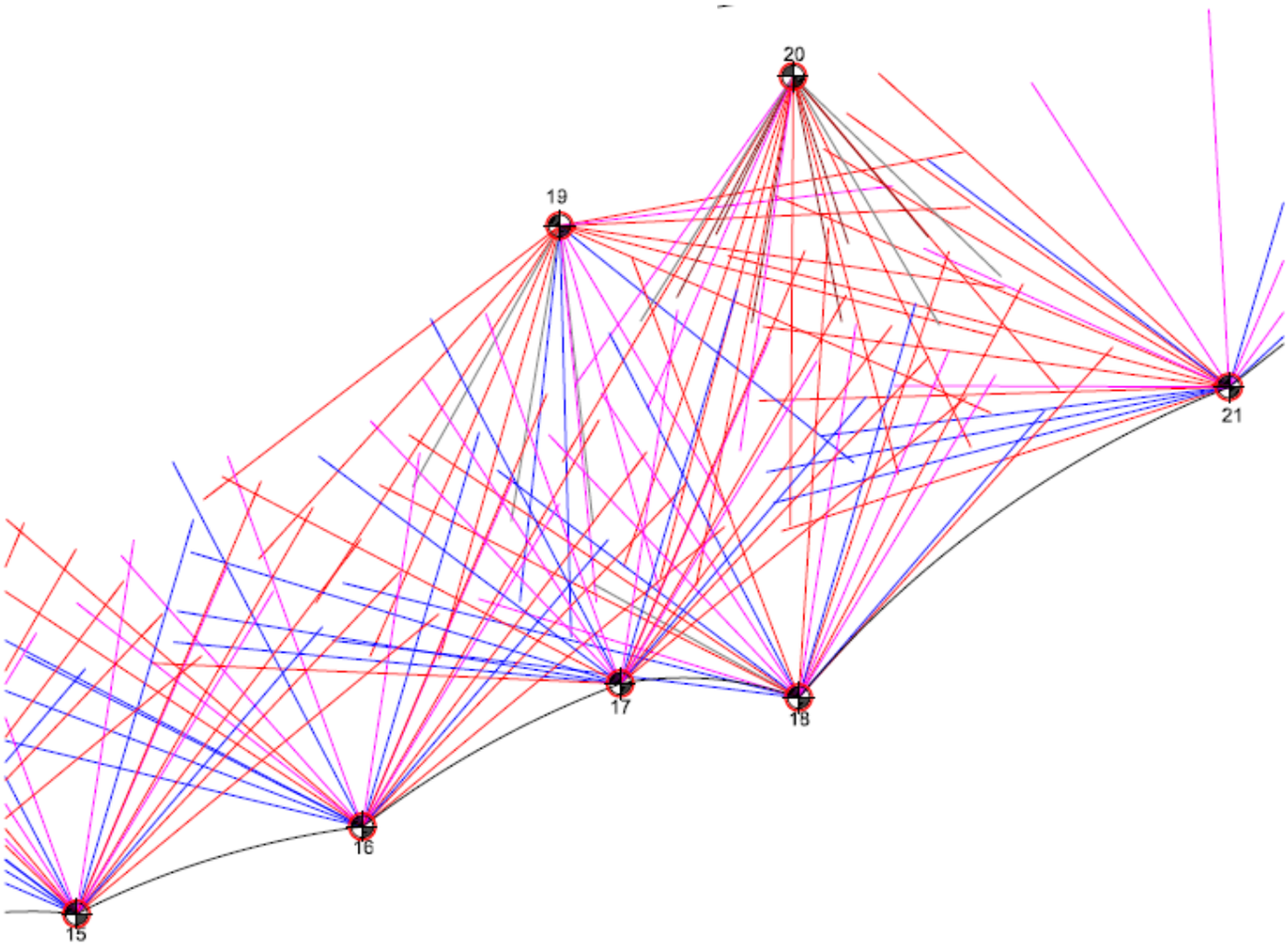
The floodlighting requirements for television broadcasts demand significantly higher lighting standards. At venues used for public races, training sessions, or competitions, the lighting is designed so that skiers are illuminated from one side and from behind, with lighting levels being planned and measured horizontally. During TV recordings, skiers are ideally lit from all angles to ensure high-definition footage is captured from the front, sides, and rear. Vertical illumination, measured at a height of 1 meter towards various camera positions, should achieve levels between 1400 and 2000 lux. It is crucial to maintain uniform lighting; excessively high values can negatively impact the quality of TV recordings.Selecting the appropriate spotlights, paired with optimal light sources emitting the required color temperature, is essential for these installations. Light calculation software is used to design and size the lighting system. The results of this planning determine the placement of masts, their height, and the number of floodlights required. Fine-tuning of the spotlights is then carried out. Each light is precisely aligned to a specific point on the ski slope, determined using laser measurements. The lighting system is then tested and adjusted based on light measurements, as needed.

Example: HD suitable floodlight – World Cup race in Flachau



21 steel masts of 30 m high were installed along the 550 m piste and equipped with a total of 420 lights of 2000W. The floodlights come with 8 different light distribution curves which enable planners to precisely determine the structure of the landscape.

Planning example



The diagram shows the indiviudal lighting points at which the floodlights are directed.

Setting up these sites requires many years of technical experience in lighting along with the application of quality technical aids which are implemented by our qualified employees.

FLOODLIGHTS LED PH

STICH® - OptiVision LED gen3.5	
Protection class:	IP66
Protection class:	I
Colour temperture:	5.700K, 4.000K or 3000K
Weight:	max. 31,5kg
Wind attack surface:	ca. 0,30m² including driver

Highlights

The headlights meet the highest performance standards, offer excellent light quality and guarantee safety and visual comfort.

Immediate restart, programmable lighting levels based on actual needs and adaptation to customer-specific needs are just a few examples.

Advantages

Excellent scattered light control and minimal light pollution thands to integrated glare hoods.

Advanced system controls allow for additional energy savings.

Reduction in maintenance costs due to the extended lifespan of LED technology.

We would be happy to prepare your offer in conventional and LED variants. This facilitates a direct comparison.

Flutlichtleuchten LED SL

STICH® - SmartArena	
Protection class:	IP67
Protection class:	I
Color temperature:	5.700K, 4.000K oder 3000K
SOLO	
Weight:	from 5kg
Wind exposure area:	~ 0,065m²
QUATTRO	
Weight:	from 20kg
Wind exposure area :	~ 0,26m²

Highlights

Due to its compact design, the spotlight is ideal for all types of retrofitting.

The spotlight is available with several dimming systems:

Basic – no dimming
Advanced – dimming at the push of a button
Performance – dimming via DMX

Advantages

With the newly developed DLC system, the light is confined exclusively to the designated area.

Energy savings through optimized LED technology.

Reduction in maintenance costs thanks to long-lasting LEDs.

We would be happy to prepare your offer in both conventional and LED versions, allowing you to make a direct comparison.

STANDARDS AND SPECIFICATIONS

The standard gives recommendations and states the requirements for good lighting to optimise visual recording of information during a sporting event, to maintain visual performance, achieve acceptable visibility conditions and limit scattered light.

European standard **EN 12193** covers the provisions for lighting sports sites with the aim of achieving good visibility for sports men and women, athletes, judges, spectators and TV and film recordings.

The provisions apply to lighting both inside and outside areas across Europe in the most commonly practised sports. Values for light sources are specified for:

- Strength of lighting
- Evenness
- Glare limitation and
- Colour properties

so that the lighting of outdoor sports sites can be planned and tested. All specifications should be Seen as minimum values.

Categories of lighting

Lighting category I	Lighting category II	Lighting category III
High performance competitions, such as **international** and national **competitions**, usually attracting high numbers of visitors and associated with large distances between the spectators and the action. **High performance training** (can also be included in this category).	**Medium-level competitions,** such as regional and local competitions, generally associated with medium spectator figures and a medium distance between the spectators and the action. **Performance training.**	**Simple competitions,** local or small club competitions, generally, with no spectators. **General training** **School sports,** **Leisure sports**

STANDARDS AND SPECIFICATIONS

Competition level	Lighting category I	II	III
International/National International	§		
Regional	§	§	
Local	§	§	§
Training		§	§
School/ Leisure Sport			§

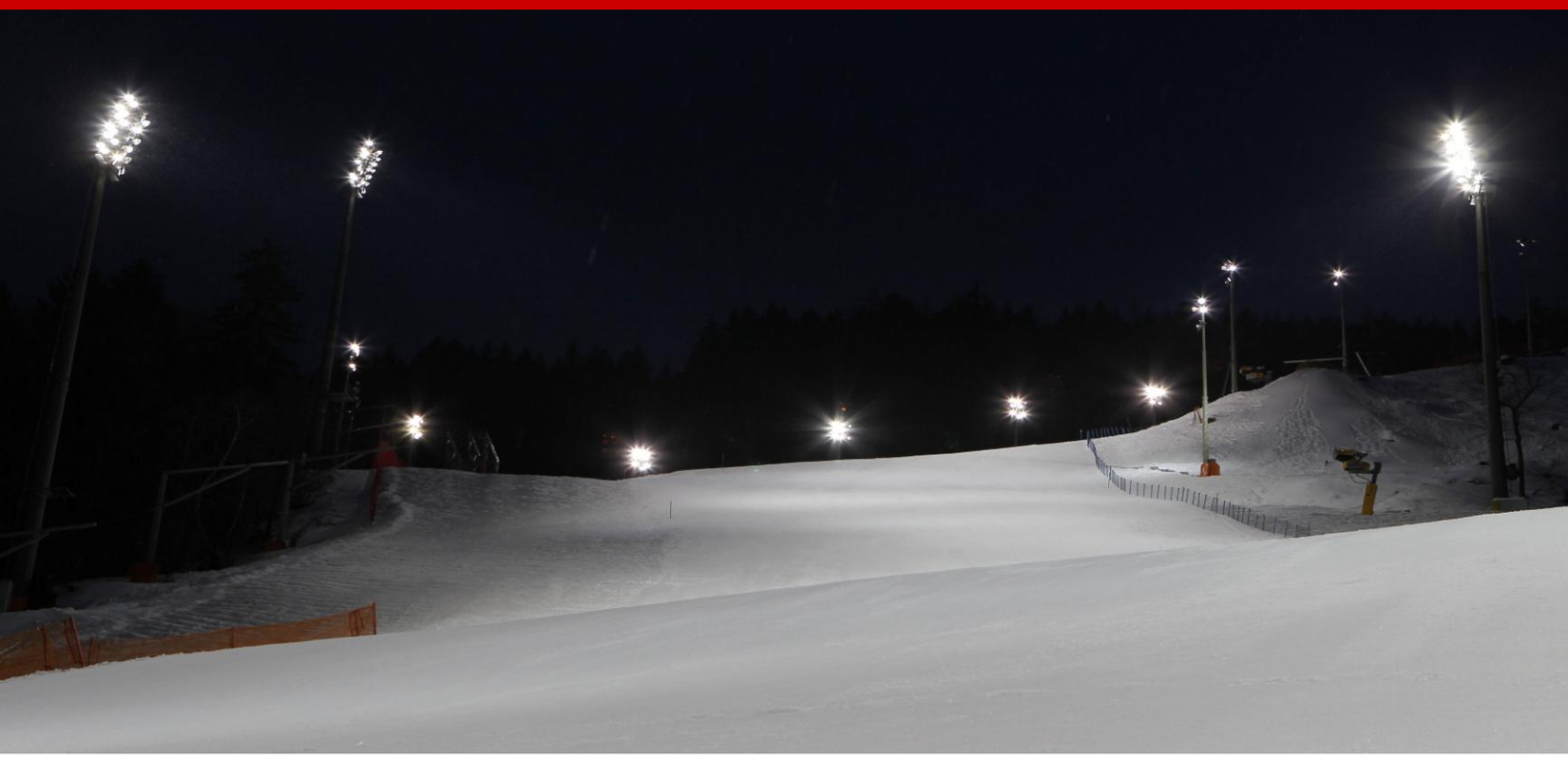
Strength and evenness of lighting: Alpine skiing – public race

Category	Em Lx	Emin/Em
I	100	0.5
II	30	0.3
III	20	0.2

Vertical illumination and evenness of lighting: Alpine skiing for FernsTV / film recordings

Category	Evm Lx	Evmin/Evmax
I	1200	0.4

Other values apply to sports such as ski jumping, sledging, ice-skating, cross-country etc.



Benefit from our expertise:

- **Detailed planning and development**
- **Light calculation and simulation**
- **Professional execution in accordance with established standards.**
- **Complete economic solutions**
- **Short construction times**

REFERENCES

Alta Badia - Full HD, Fis Ski Worldcup

Mast assembly

Floodlighting, Alta Badia

REFERENCES

Lenggries (Bad Tölz) - FIS

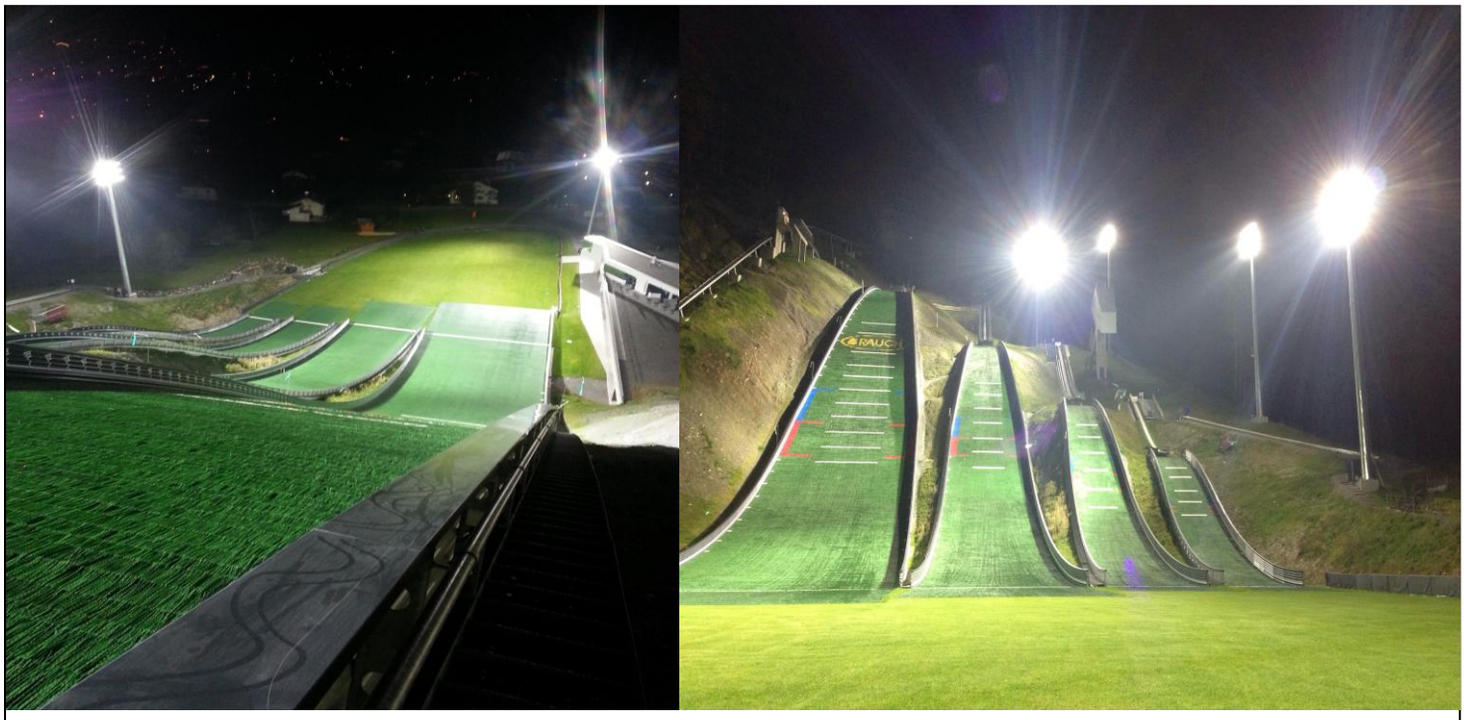
Mast assembly

Floodlighting, Lenggries

REFERENCES

Tschagguns

Mast assembly



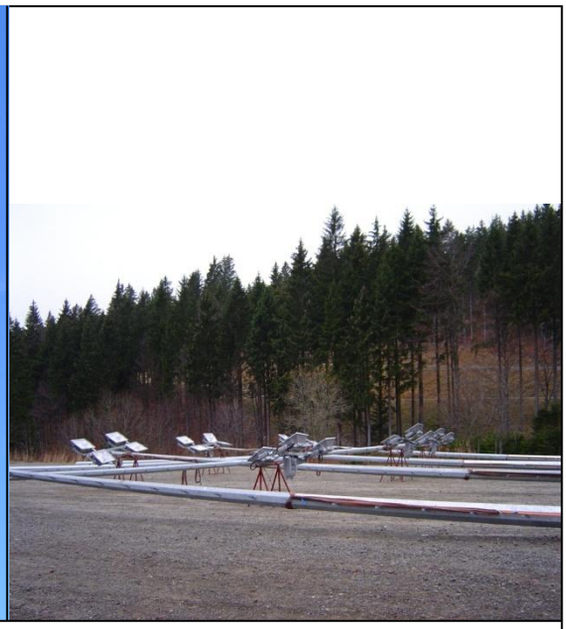
Floodlighting, Tschagguns

REFERENCES

Hochficht floodlit site

Floodlighting

Installation by helicopter



Mast assembly

Patscherkofel floodlit site

Floodlighting

Floodlighting

REFERENCES

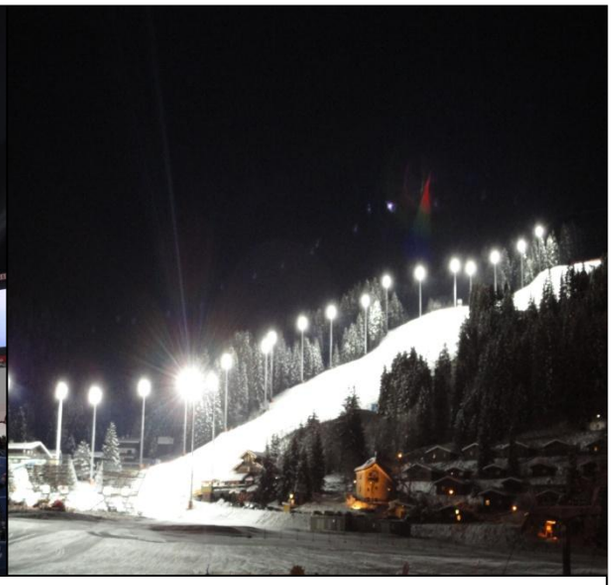
Hochkar floodlit site

Valley station

Mast installation

Flachau floodlit site

FIS World Cup Women's Slalom



First full HD-TV suitable floodlit site

REFERENCES

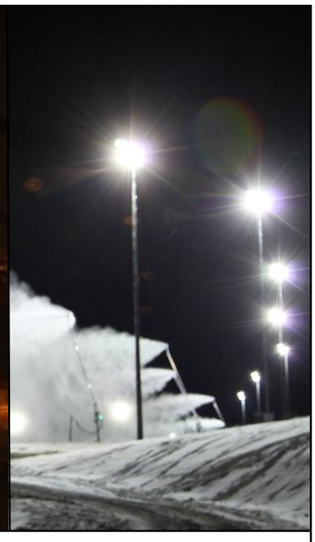
Schladming, Planai floodlit site

FIS-Worldcup Men and Women´s Slalom

Floodlighting

Erzurum, Turkey, floodlit site

Floodlighting Erzurum Turkey



Floodlighting

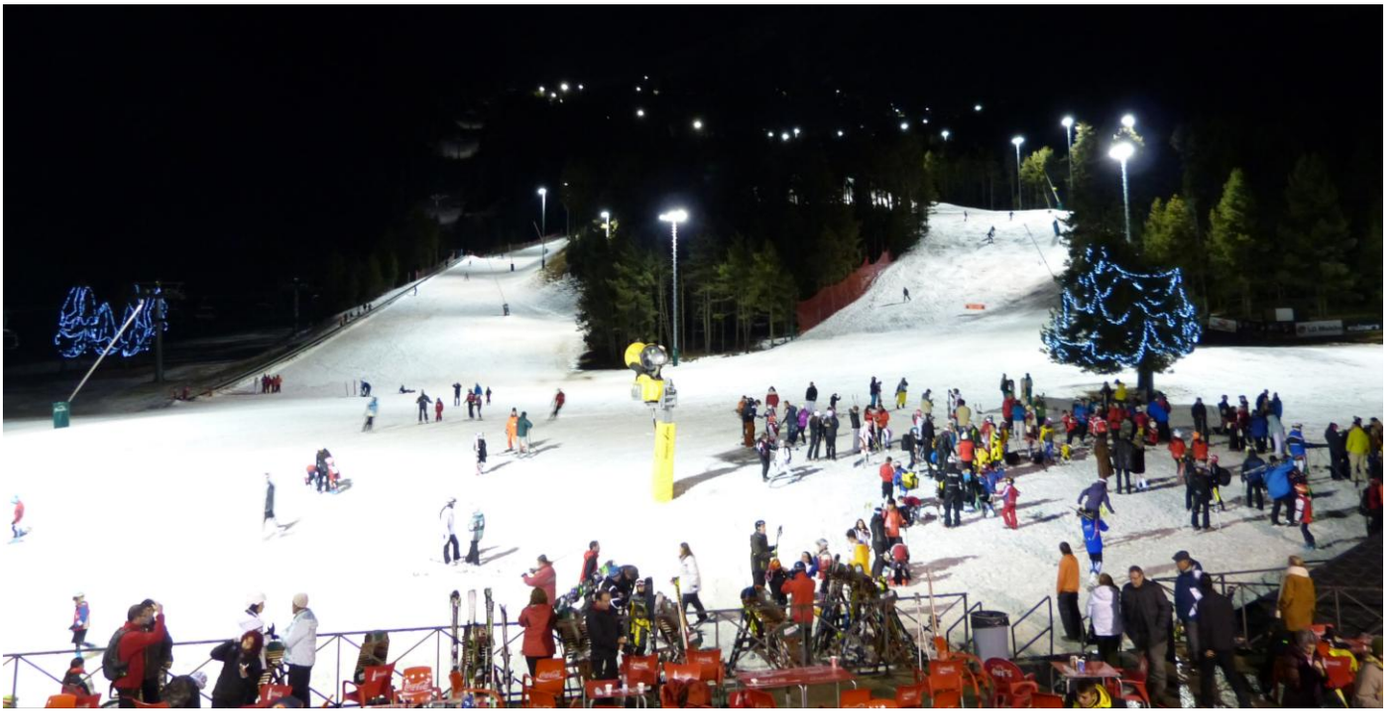
REFERENCES

Masella, Spain, floodlit site

Floodlighting Masella, Spain

REFERENCES

View viewers



View ski driver

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Place of jurisdiction: Villach Court of jurisdiction: Klagenfurt
Chamber membership: Economic Chamber Austria/ Carinthia
Supervisory authority: Administrative authority of Villach

STICH®

Professional lighting solutions.

Subject to modification. Errors excepted.