Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Sports Lighting Secrets

How to Get Best Value for Your Agency and Community

Presented by

Bill Whitman

Sports Lighting Specialist

DMD & Associates Ltd.

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Presentation Goals

- Educate you about what is involved in a sports lighting project
- Expose insights about how you can best value (the secrets)
- Show you how to save money on your next project
- Provide "gems of wisdom"
- Such as, "Your next good idea may get you promoted …

  … or fired."
- Answer your questions

Why Light a Sports Field?

- Extend playing time into the evening
- Provide recreational opportunities in societal leisure periods
- Concentrate field demand into fewer facilities
- Provide an exciting opportunity for amateurs to play under the lights

What Are You Buying?

You are purchasing

- Light on the field (performance)
- An electrical supply system
- Lighting controls
- A facility that has to be maintained
- A facility that uses power

Introduction

Engage a Specialist

Involve Stakeholders

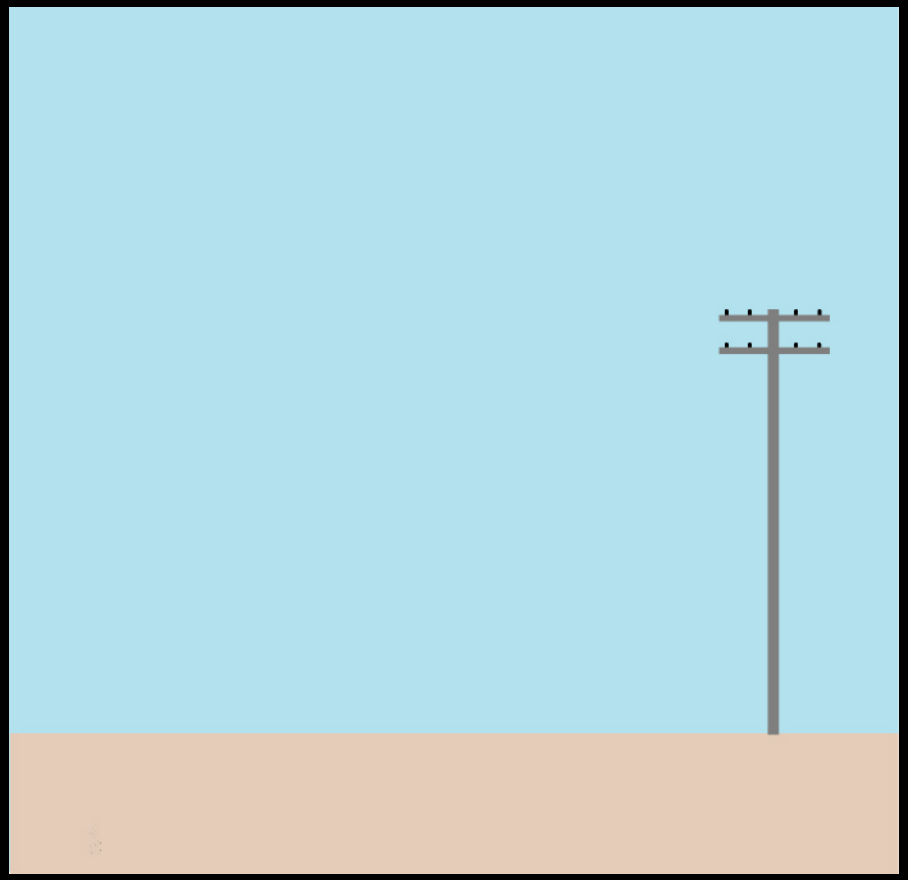
Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Typical Elements in a Sports Lighting Project



Utility Power

Introduction

Engage a Specialist

Involve Stakeholders

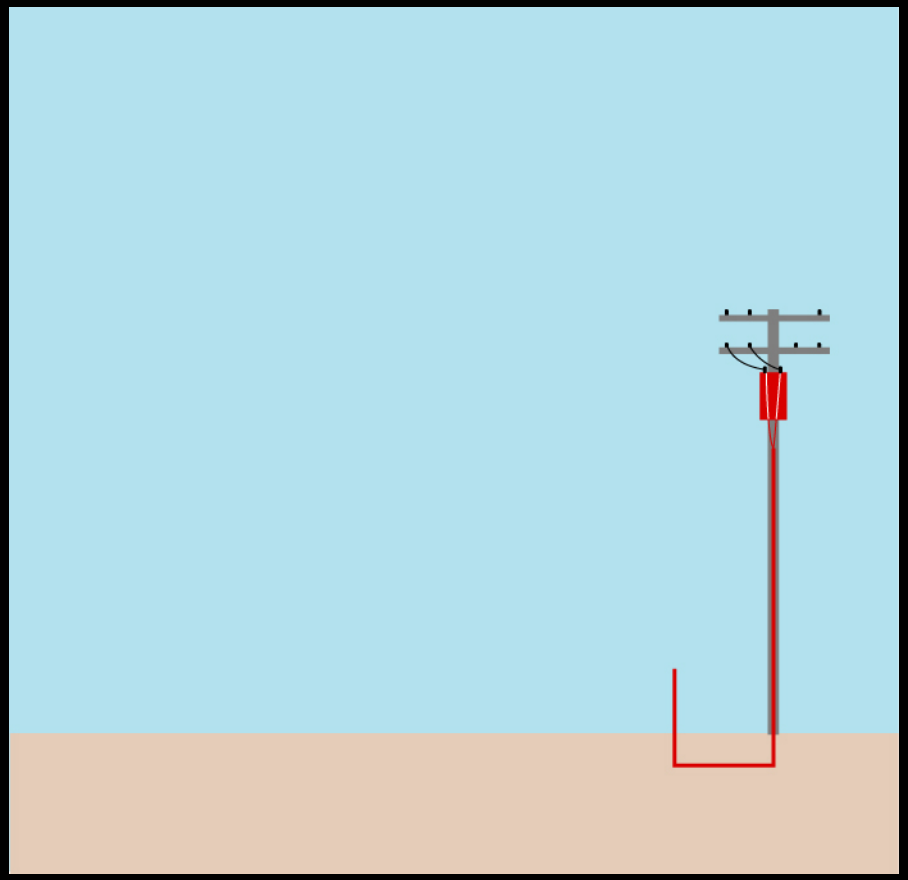
Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Typical Elements in a Sports Lighting Project



Transformer

Utility Power

Introduction

Engage a Specialist

Involve Stakeholders

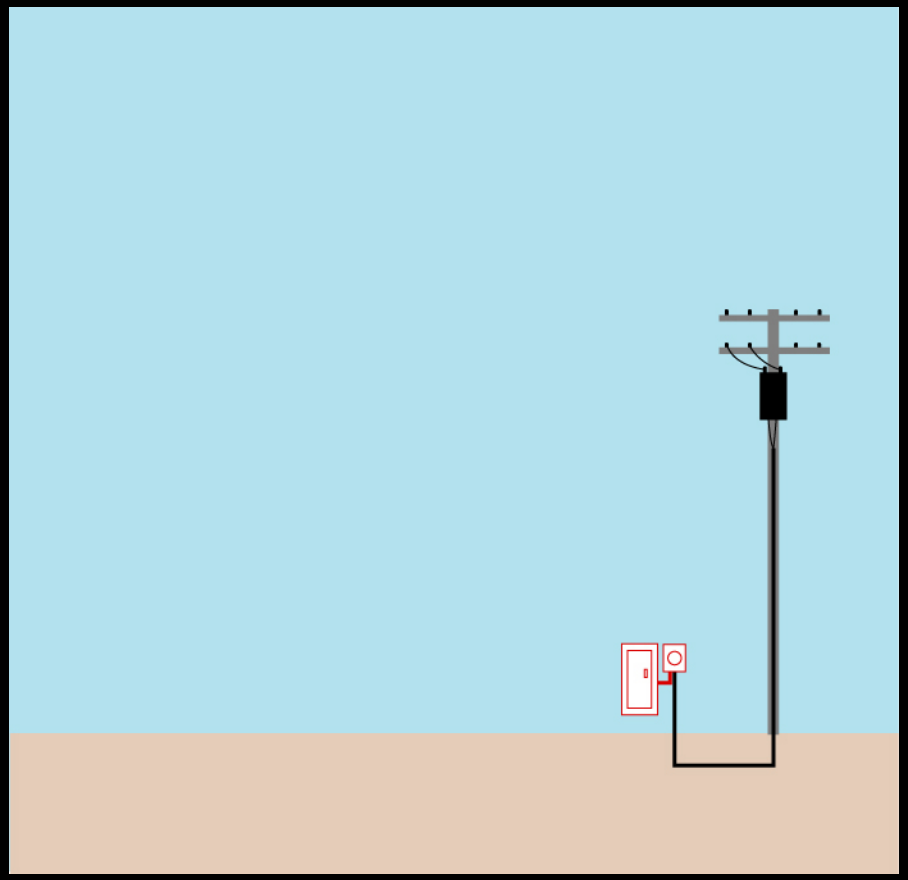
Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Typical Elements in a Sports Lighting Project



Electrical Service

Transformer

Utility Power

Introduction

Engage a Specialist

Involve Stakeholders

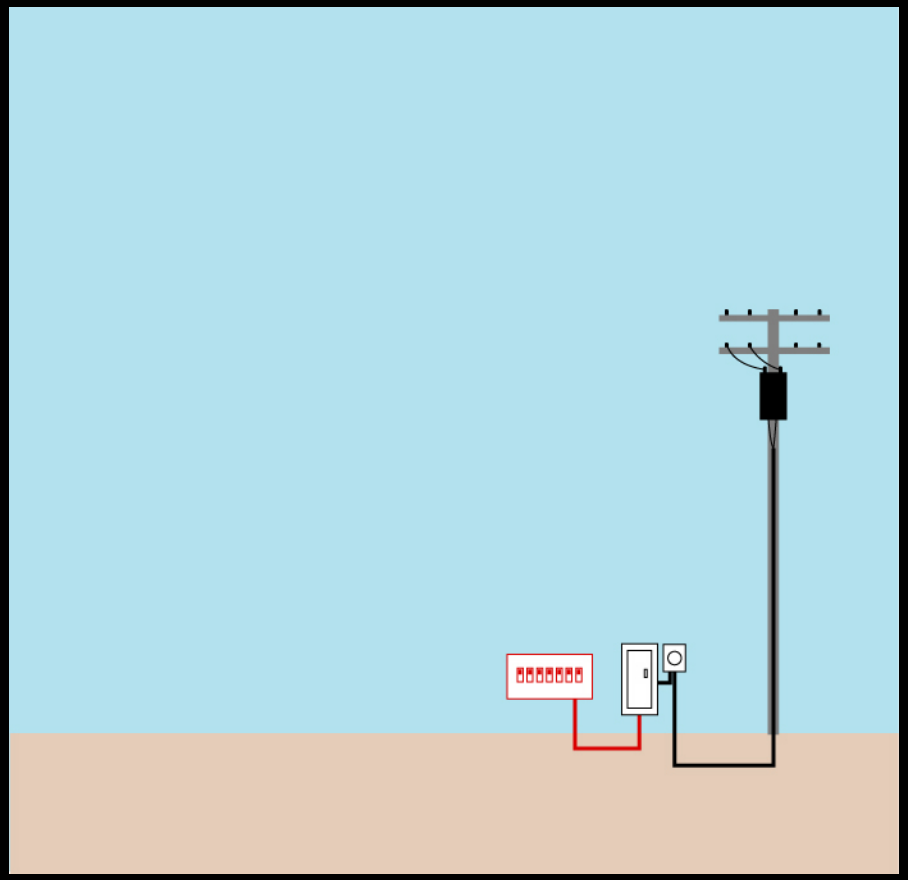
Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Typical Elements in a Sports Lighting Project



Lighting Controls

Electrical Service

Transformer

Utility Power

Introduction

Engage a Specialist

Involve Stakeholders

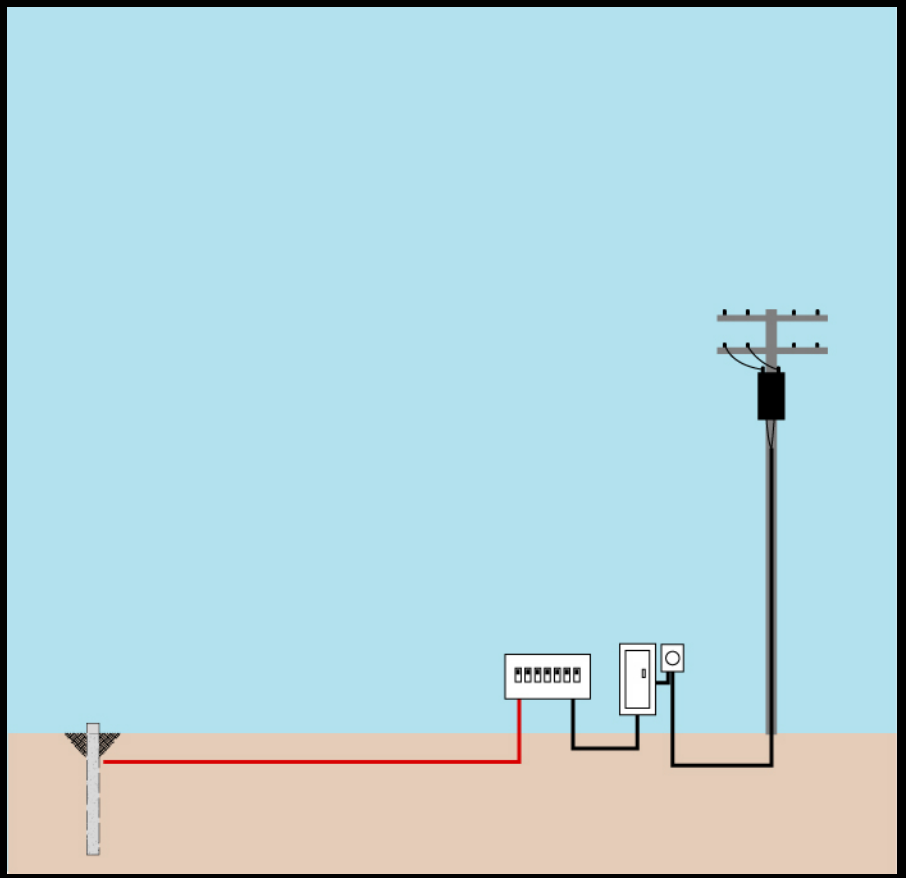
Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Typical Elements in a Sports Lighting Project



Power Distribution

Lighting Controls

Electrical Service

Transformer

Utility Power

Introduction

Engage a Specialist

Involve Stakeholders

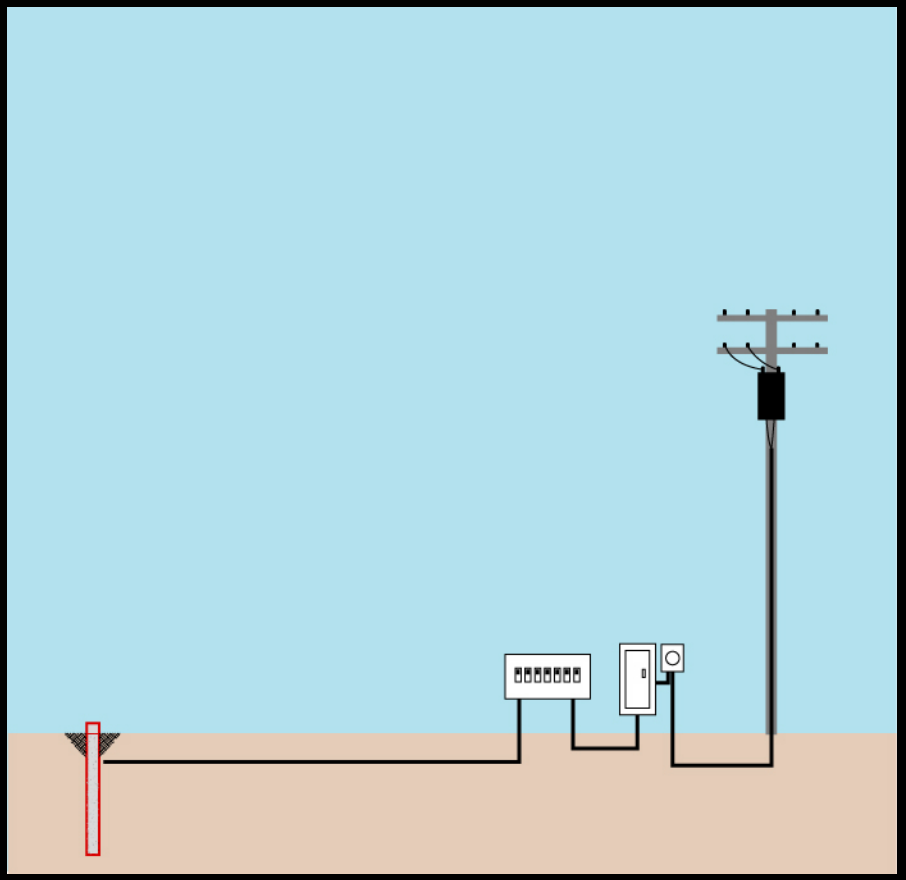
Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Typical Elements in a Sports Lighting Project



Foundations

Power Distribution

Lighting Controls

Electrical Service

Transformer

Utility Power

Introduction

Engage a Specialist

Involve Stakeholders

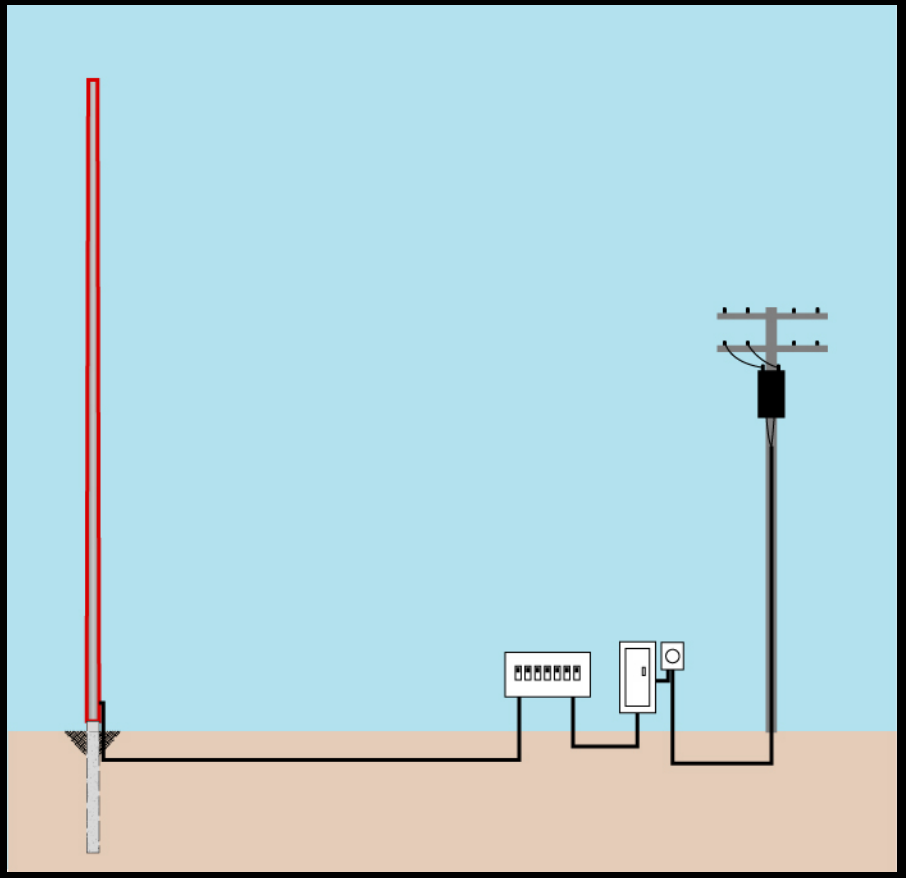
Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Typical Elements in a Sports Lighting Project



Poles

Foundations

Power Distribution

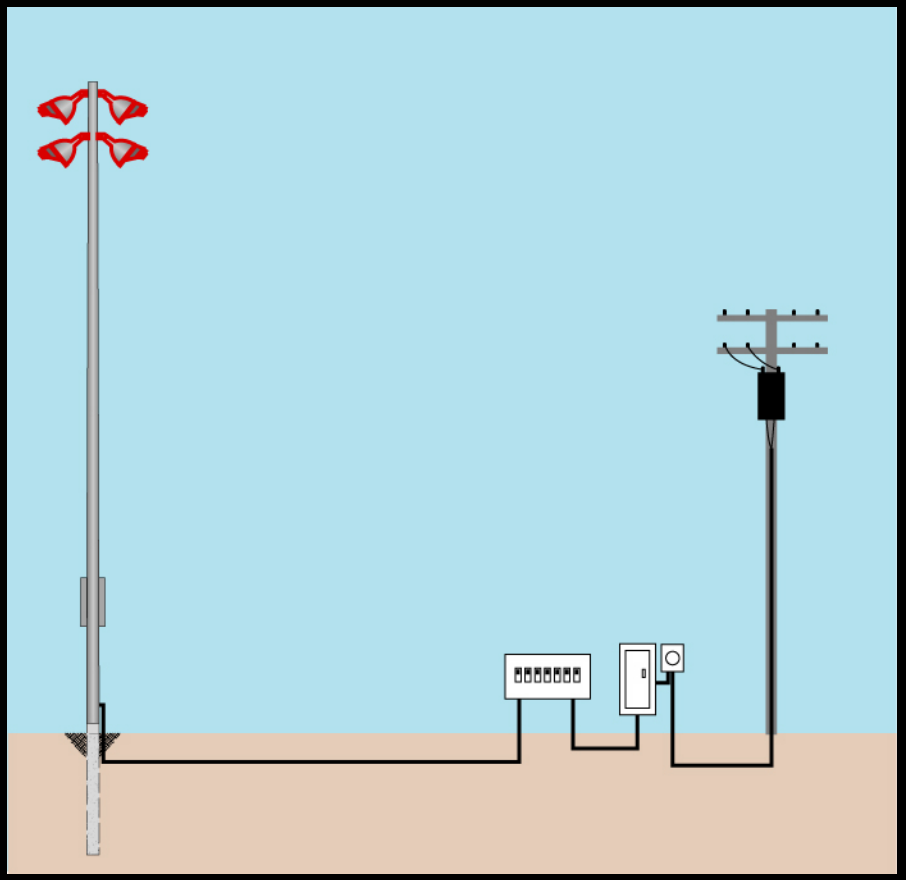
Lighting Controls

Electrical Service

Transformer

Utility Power

Typical Elements in a Sports Lighting Project



Luminaires

Poles

Foundations

Power Distribution

Lighting Controls

Electrical Service

Transformer

Utility Power

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Sports Lighting Systems are Not Toasters

They are purposefully constructed of many pieces that are artfully designed.

Each system is uniquely engineered for a specific site and situation.

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Basic Facts

- Sports lighting projects are in the domain of electrical engineering
- This market is very small compared to other typical EE projects (few specialists)
- Non-specialist firms may do from zero to one or two projects every few years
- Most EE projects are awarded to local consultants
- Owners may regard sports lighting as simple, or “plug and play”
- You may get a consultant with little or no sports lighting experience for your project unless you insist on a specialist

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Reality Check

- Sports lighting is complex with many unique variables
- Sports lighting projects are high-profile facilities that capture attention
- Design challenges may include
  - Photometric analyses
  - Obtrusive light studies and mitigation
  - Design of specialized controls
  - Public Involvement
- Satisfactory “fixes” are not easy to apply

Reality Check (continued)

- Poorly designed projects cost more…
  - Design ambiguities result in higher bids
  - Change orders increase costs
  - Inefficient systems cost more to operate and maintain

  … and impact public acceptance of future sports lighting projects
  - Obtrusive light impacts (NIMBY)
  - The most offensive facilities are the poster children for public sentiment
- Do you want to trust your project to a non-specialist?

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Why a Specialist?

- Realistic Cost Estimates
  - Not wild guess or a sales pitch
  - Ignorance either makes you bold, or scares the pageebers out of you.
  - Class A, B, C, or D Cost Estimates
  - Eliminates “going back to the well”
- Efficient use of design dollars
  - Insights gained from experience are applied to your project
  - Quick start, no surprises
  - Appropriate design fees
- Independent analyses of alternates

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Why a Specialist? (continued)

- Effective coordination with other disciplines and identification of issues you may not have considered
- Objective advice based on facts
- Proper, project-focused specifications and appropriately detailed drawings
- Delivery of expected performance
  - Scrutiny of suppliers' marketing claims
  - Resolutions of construction issues
  - Valid performance testing

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

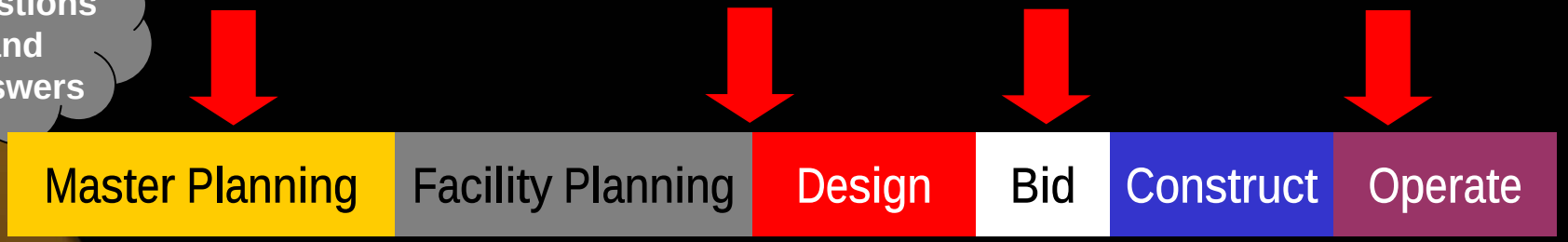
Consider the Future

Control Capital Costs

A Specialist Brings Value throughout the Process

- Early engagement means maximum value and avoiding unpleasant surprises
- A specialist saves you money and delivers a superior project

Questions and Answers



Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Selection Questions

- How many sports lighting projects do you do on a yearly basis?
- Can you provide advanced analysis of photometrics and obtrusive light?
- What type of public involvement capabilities do you have?
- What is your record for cost-estimating and change orders on recent projects?

Selection Questions
(continued)

- Explain some innovations that you have provided to clients for sports lighting projects
- Describe your process for verifying the performance of a sports lighting installation
- Provide us with references for five recent sports lighting projects.

Questions to Ask Yourself

- Will this consultant be enjoyable to work with?
- Will this consultant's capabilities meet the needs of my project?
- If I don't hire a specialist, will I be able to properly evaluate my consultant's design?
  - Photometric analyses
  - Obtrusive light studies / mitigation design
  - Options for controls / ladder logic
  - Verify specified equipment is appropriate

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Who is a Stakeholder?

- Anyone with an interest in your project
- Stakeholders may form into groups
- One individual may be a member of several stakeholder groups

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Identification of Stakeholders

- Facility Users
- Neighbors
- Recreational Staff
- Concerned Citizens
- Maintenance Staff
- Taxpayers

Introduction
Engage a Specialist
Involve Stakeholders
Reduce Energy Use
Consider the Future
Control Capital Costs
Questions and Answers

Summary of Concerns

Typical Concerns	Stakeholder Group: Field Users	Neighbors	Recreational Staff	Concerned Citizens	Maintenance Staff	Taxpayers
Controls	●	●	●	●	●	
Obtrusive Light		●	●	●		●
Capital Costs				●		●
Energy Consumption	●			●	●	●
Life Cycle Costs				●		●
Durability/Access/Docs					●	
Quantity/Quality of Light	●					●

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Stakeholder Concerns

- Most stakeholder concerns can be satisfied
- Owners should identify concerns early and establish a process of involvement
- Public/community involvement is essential

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Expectations may include the consultant to
  - Plan and attend open houses
  - Give testimony at hearings
  - Prepare media kits and press releases
  - Present focused analyses and report
  - Develop simulations and explanatory graphics
- Very few electrical firms can adequately handle these assignments
- Poor performance in public involvement can jeopardize a project

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Keys to success are skill and preparation

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime Simulations

Improved Fields without Lighting

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime Simulations

Improved Fields with Six-Pole Aimable System

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime Simulations

Improved Fields with Sixteen-Pole Fixed, Full-Cut-Off System

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime/Nighttime Simulations

View from the Tee Line at Newcastle

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

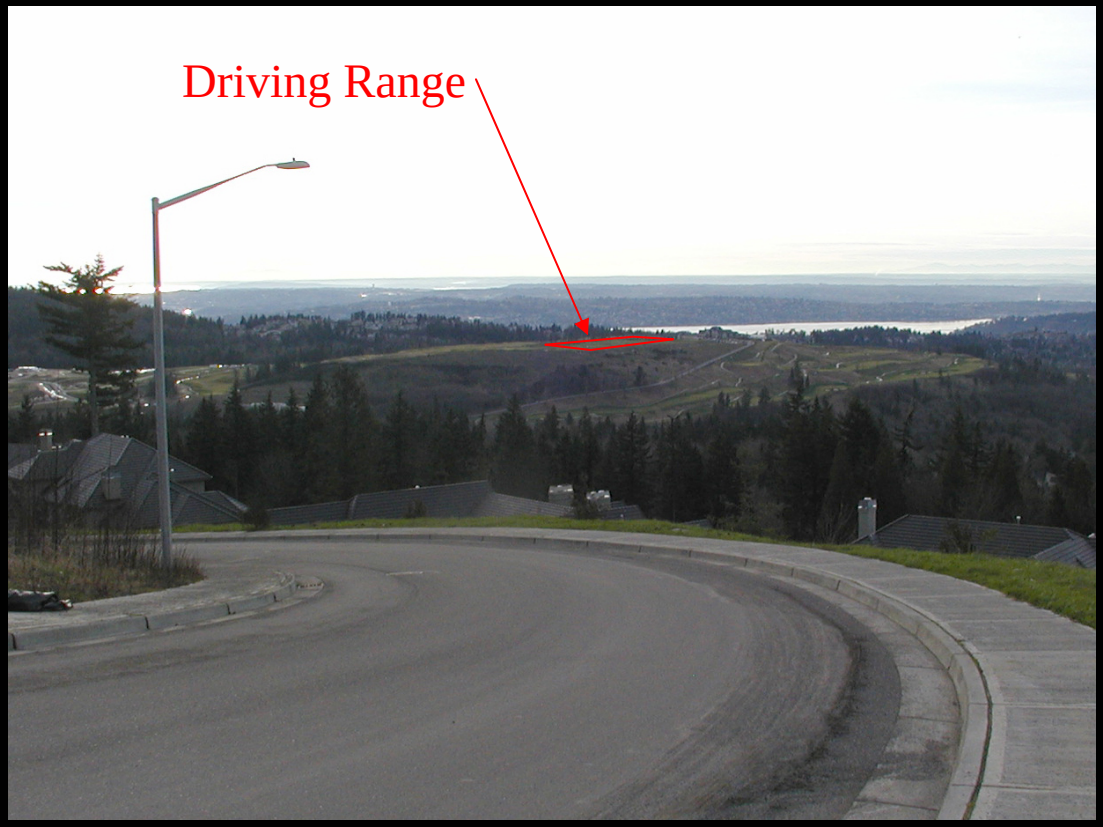
Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime/Nighttime Simulations



View from The Pinnacle Neighborhood

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime/Nighttime Simulations

Existing conditions – no lighting

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime/Nighttime Simulations

Simulation of proposed lighting

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime/Nighttime Simulations

Simulations can include complete facilities, not just lighting. Existing conditions shown here.

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime/Nighttime Simulations

Client asked to show additional wetlands, new fields, amenities and sports lighting system.

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Daytime/Nighttime Simulations

Nighttime simulation approximates control of light. Client used the simulations to promote the project to users and the community.

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Analyses and associated graphics

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

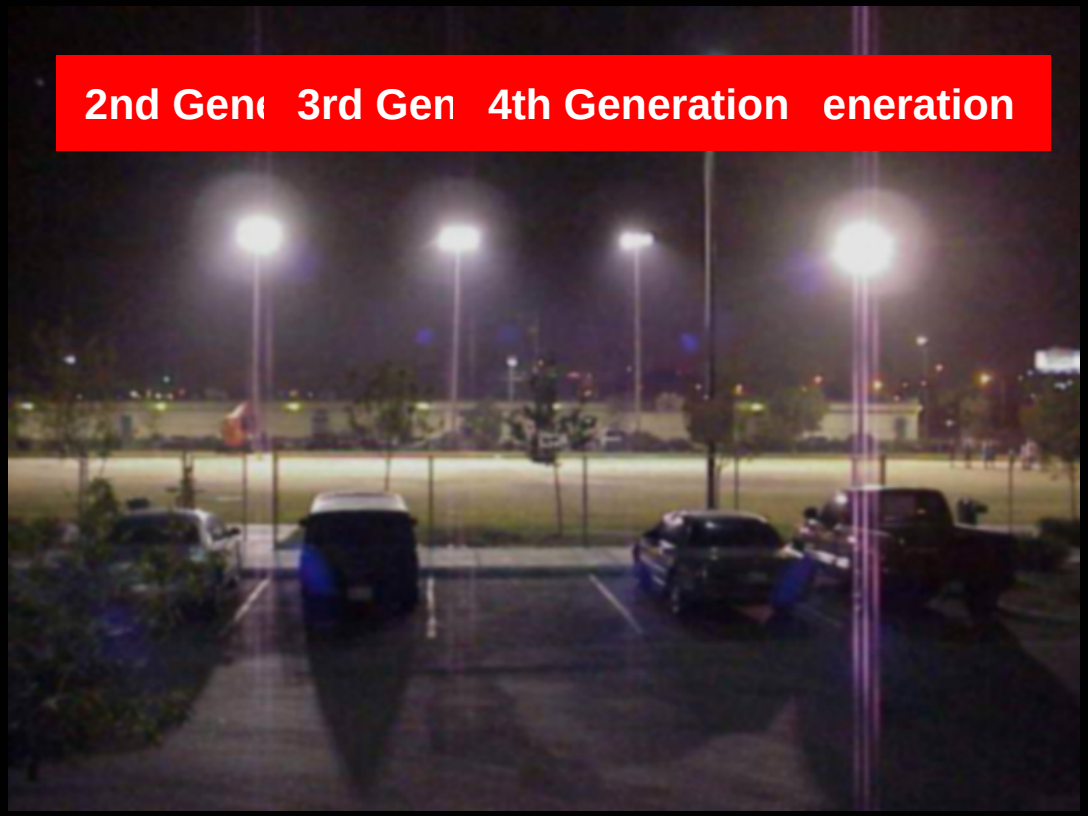
Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Analyses and associated graphics



Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

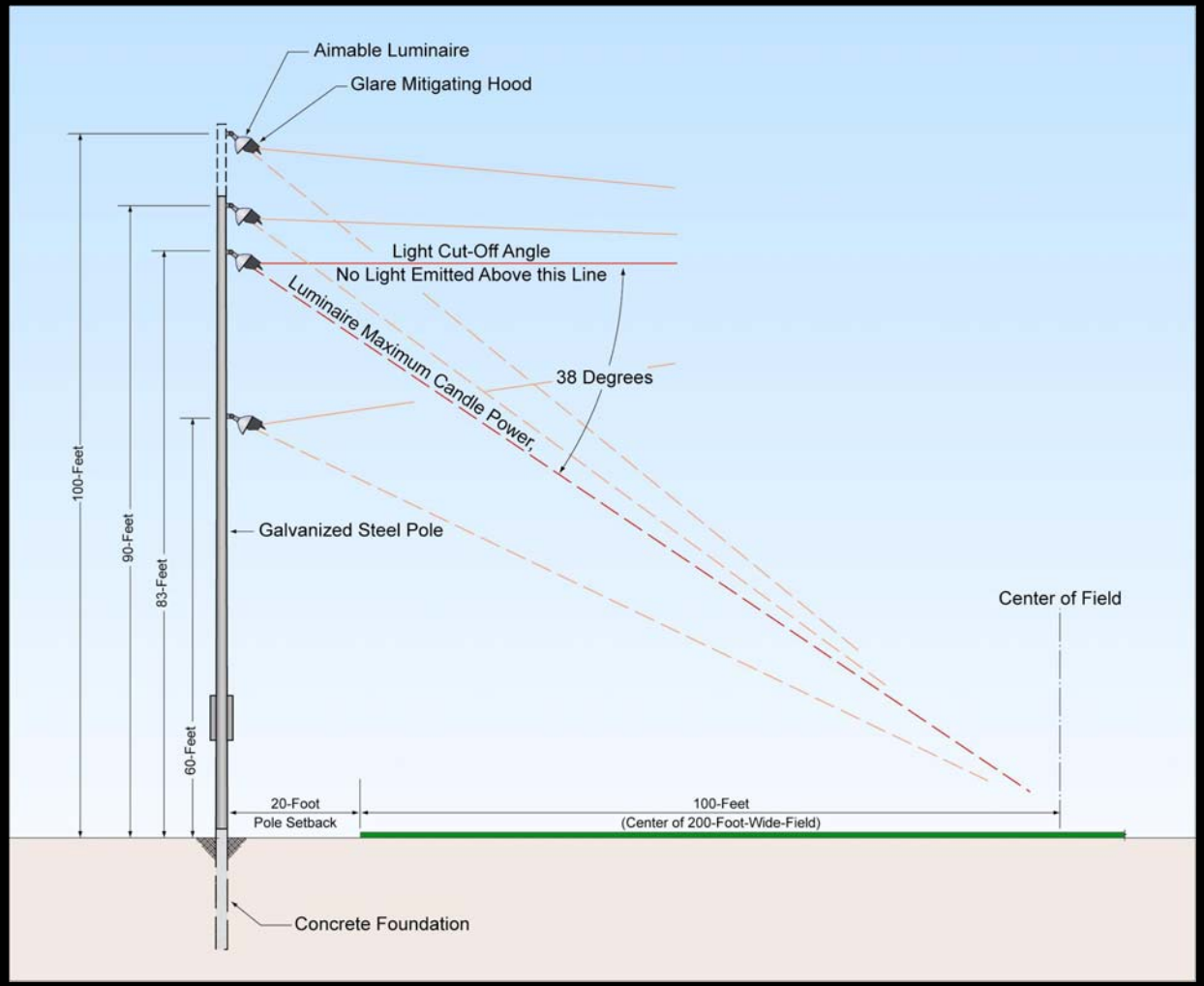
Consider the Future

Control Capital Costs

Questions and Answers

Public Involvement

- Analyses and associated graphics



Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Conclusion

- Don’t underestimate any stakeholder’s concern
- Concerns can nearly always be successfully addressed
  - Explaining terms (make sure you are both talking about the same thing)
  - Applying terms to real life
  - Providing exhibits/graphics
- Education and an open process are the keys

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Capital Costs are Once, Energy Costs are Forever

- Sports lighting consumes large amounts of energy
- Depending on local utility, costs may involve demand charges
- Not all fixtures have equal photometrics – it takes more less efficient fixtures to light a field properly
- Not all activities require the same amount of light

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Over Lighting Sports Fields is Common

- Design and construction inconsistencies have proven to be cruel task masters
- As a result, many fields are over lighted by as much as 20 percent or more
- The last thing a lighting designer wants to find is that illumination levels are too low

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

How to Avoid Over Lighting

- Involve the lighting supplier in the illumination design
- Specify performance and require a guarantee from the supplier
- Require factory aimed fixtures
- Audit submitted lighting designs carefully
  - Errors are common, some supplier cheat
  - Anything I tell you is the truth unless you know better

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Energy Saving Strategies

- Use efficient fixtures
  - Requires photometric analyses
  - Specialists know which suppliers have the most efficient fixtures for specific applications
- Design controls that turn on the lights "just in time"
- Use dimming systems to provide the right amount of light for the activity
- Use switching to give users a choice when full lighting is not needed

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Real Life Example

- Civic Stadium, Bellingham, WA

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

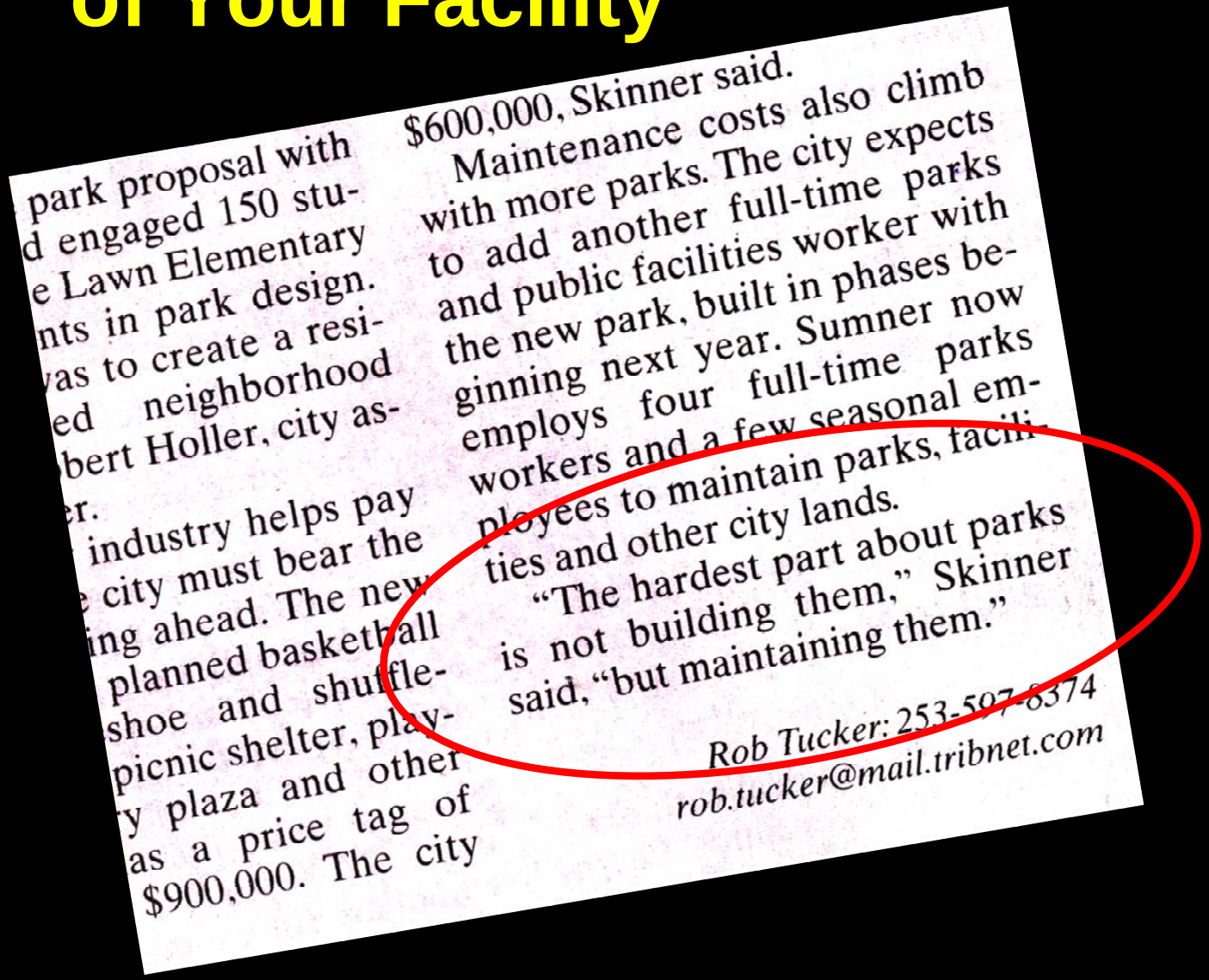
Questions and Answers

Real Life Example

- 5000 seat football/soccer/track
- Typical use
  - 1000 hours of illuminated use per year
  - 75 percent of activities are Class III or IV
  - 25 percent of activities are Class II
- Illuminated to 50 fc maximum
- Dimming system allows 25 fc level
- Savings $8000 per year at current (2002) energy rates over previous system (17 fc) and full power (50 fc)

- Introduction
- Engage a Specialist
- Involve Stakeholders
- Reduce Energy Use
- Consider the Future
- Control Capital Costs
- Questions and Answers

Maintenance is for the Life of Your Facility



park proposal with
d engaged 150 stu-
e Lawn Elementary
nts in park design.
as to create a resi-
ed neighborhood
bert Holler, city as-
er.

industry helps pay
city must bear the
ing ahead. The new
planned basketball
shoe and shuffle-
picnic shelter, play-
y plaza and other
as a price tag of
$900,000. The city
$600,000, Skinner said.

Maintenance costs also climb with more parks. The city expects to add another full-time parks and public facilities worker with the new park, built in phases beginning next year. Sumner now employs four full-time parks workers and a few seasonal employees to maintain parks, facilities and other city lands.

"The hardest part about parks is not building them," Skinner said, "but maintaining them."

Rob Tucker: 253-597-8374
rob.tucker@mail.tribnet.com

Durability of Materials

- Choose materials that will stand the test of time

Ease of Maintenance

- Add innovations to make the life of your maintenance staff easier

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Ease of Maintenance

- Add innovations to make the life of your maintenance staff easier

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Obtrusive Light Design

- Neighborhoods move in around developed facilities
- If facilities are obtrusive, neighbors will complain
- The current trend is to limit lighting
  - International Dark-Sky Association (reduce light pollution – sky glow)
  - Illuminating Engineering Society of North America (trend toward visibility standards)

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

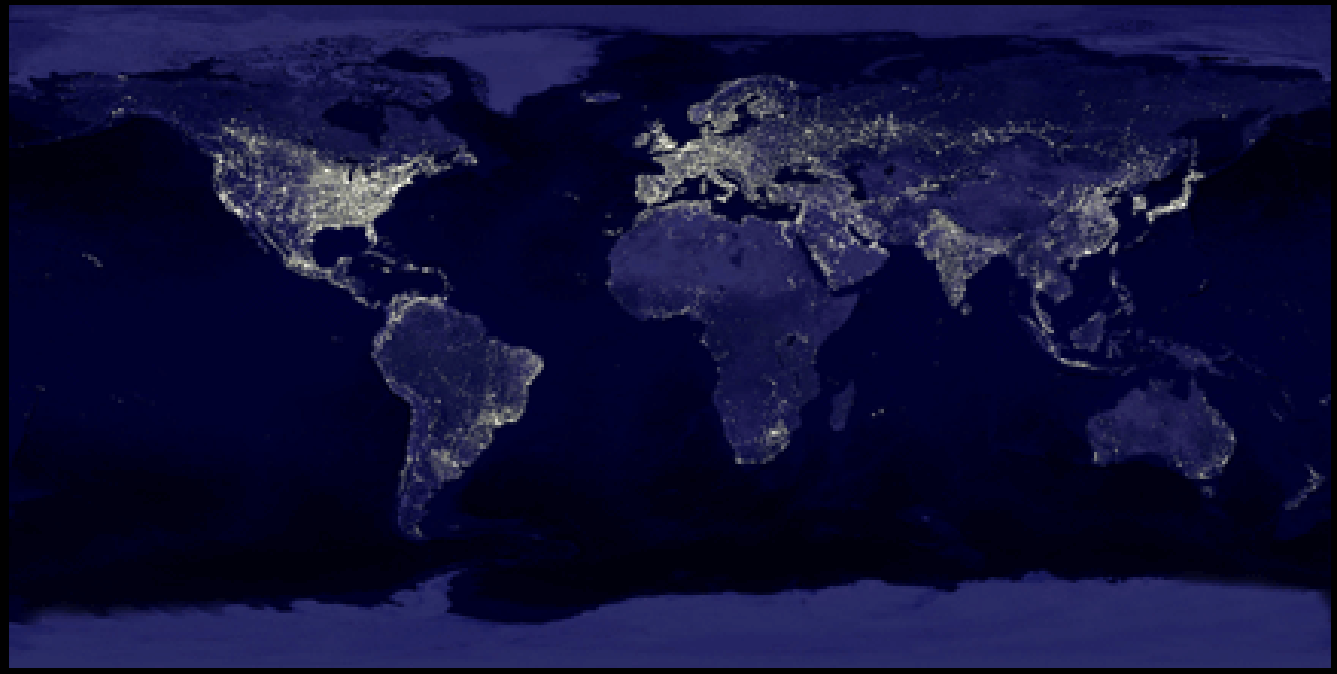
Consider the Future

Control Capital Costs

Questions and Answers

Obtrusive Light Design

- Wasted light is very prevalent



Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Design for Future Now

- Consider pre-ducting for future devices (inexpensive now)
  - Scoreboards and public address (PA)
  - Irrigation systems
  - Convenience outlets
  - Security and parking lot lighting
  - CCTV
- Size electrical service to accommodate future needs
- A specialist consultant will address these issues early on

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Design for Future Now

- Pre-ducting and adding speaker brackets saved this owner $50,000 for installation of a PA system

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Don’t Overpay for Your Sports Lighting Project

- Design for the appropriate level of light using IESNA standards
- Don’t play the ego game
- Higher illumination levels required for
  - Higher levels of competitive play
  - Smaller, faster targets (balls)
  - Aerial sports
  - Increased number of spectators
  - Television coverage (vertical levels)
- Choose the appropriate level

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Sports Lighting Fixtures Are Costly

- Minimize the number of fixtures
  - Use 1500-watt fixtures instead of 1000-watt fixtures and save 1/3+ on capital cost
- Use most the most efficient fixture available to reduce the total needed
  - Efficient fixtures place light on the field
  - You pay for every lumen, even if wasted
  - The less efficient the fixture, the more fixtures ($$) you will need
- There is no way to tell if a fixture is efficient by visual examination

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Play the Bid Game

- Ask for competitive bids to get the best price, even if you know which product you want
- Your sports lighting specialist must be able to analyze fixture photometrics to ensure that alternates are equal
- Performance should be the basis for considering alternate systems
  - Specify the level of Illumination, uniformity, control of obtrusive light
- Do not trust unverified claims from suppliers – watch out for tricks

Introduction

Engage a Specialist

Involve Stakeholders

Reduce Energy Use

Consider the Future

Control Capital Costs

Questions and Answers

Stump the Speaker

- This is a chance to answer your questions
- Please fill out the ORPA evaluation forms
- Leave your business card if you have a specific need
- Pick up materials
- You can't win at racquetball while wearing bifocals