



May 18, 2015

Glen Markegard, Planning Manager
City of Bloomington
1800 W. Old Shakopee Road
Bloomington, MN 55431-3027

Subject: Request to Amend Condition #21 – Site Development Agreement

Thank you for the opportunity to present our proposed maintenance lighting solution at the 4/27/2015 City Council Work Session. Per the City's direction, the Park District requests that this item be formally considered at the June 22, 2015 City Council meeting.

At the April 27th, 2015 meeting, City Council directed the Park District to submit a formal request to amend the condition to allow the Park District to install the proposed maintenance lighting solution as a pilot for the 2015/16 season with the understanding that, the City Council will review a future amendment to remove the up-slope lighting requirement based on the pilot lighting system's success in reducing glare and negative impacts to surrounding property owners.

The following summarizes the Park District's request, along with the attached Development Application, required fee, and supporting documentation.

Request to Amend Condition No. 21

Background

Three Rivers Park District (Park District) is requesting an amendment to Condition No. 21, Exhibit B, of the April 9, 2014 Site Development Agreement for the HSSA Chalet Re-development project. Condition No. 21 reads as follows:

To reduce the impacts of ski slope lighting on surrounding property owners, by November of 2015 Three Rivers must install a secondary slope lighting system for maintenance purposes. The secondary slope lighting system must direct all lights up-slope and must be circuited to allow multiple maintenance zones. After hours and except for emergencies, general slope lighting must be extinguished and lights for maintenance purposes may only be used when maintenance is underway in a particular maintenance zone.

Request

The Park District requests an amendment to the condition to remove the up-slope lighting requirement from the 15/16 season, and instead, allows for installation of a pilot maintenance lighting system for the 15/16 season to demonstrate success in reducing impacts to surrounding property owners.

Rationale

The rationale behind the request is:

- The Park District's proposed maintenance lighting solution, while it *does* reduce the impacts of ski slope lighting on surrounding property owners as measured at the property line and allows for multiple maintenance zones,
- it *does not* "direct all lights up-slope"

- The Park District's proposed maintenance lighting solution, comprised of existing fixtures, new LED angled fixtures with shields, and re-circuiting to allow for multiple maintenance zones, achieves:
 - a 98% reduction in light levels measured at the property line during nightly grooming and
 - a 65% reduction during snow-making operations at season startup and as-needed thereafter.
- In conversations with the Park District's engineer and LED light manufacturer, this maintenance lighting solution will achieve virtually the same result of a system directing all lights up-slope as the only light component remaining in both cases is the "indirect" light reflecting off the snow.
- The Park District's proposed maintenance lighting solution is also more cost-effective than installing an entirely separate and redundant up-slope lighting system.

Requested amendments to the condition

The requested amendments are shown in blue text:

21) To reduce the impacts of ski slope lighting on surrounding property owners, by November of 2016 Three Rivers must install a secondary slope lighting system for maintenance purposes (including grooming and snow-making). The secondary slope lighting system must direct all lights up-slope and must be circuited to allow multiple maintenance zones. After hours and except for emergencies, general slope lighting must be extinguished and lights for maintenance purposes may only be used when maintenance is underway in a particular maintenance zone.

For the 2015-2016 ski and snowboard season, Three Rivers may install a pilot maintenance lighting system designed to reduce impacts on surrounding property owners through the use of shields, louvers or angled fixtures rather than by directing all lights up-slope. In February of 2016, Three Rivers may apply again to amend this condition and remove the up-slope lighting requirement for maintenance lighting. The City Council will review any future amendment to the up-slope lighting requirement based on the pilot lighting system's success in reducing impacts to surrounding property owners.

Sincerely,



Amy Gurski
Director of Design - Three Rivers Park District

Attachments

- Development Application
- Fee
- 4/27/15 City Council Work Study Session: Excerpts from presentation slides, including key graphics and photos
- LED 96 Fixture Picture
- Evolution of Light Control with LED 2
- Photo metrics
- Light fixture cut sheet

CC: Randy Quale, City of Bloomington
Boe Carlson, Superintendent-Three Rivers Park District
Tom McDowell, Associate Superintendent-Three Rivers Park District
Fred Seymour, Alpine Services Manager-Three Rivers Park District

HSSA Lighting Operations Plan

Condition #21:

To reduce the impacts of ski slope lighting on surrounding property owners, by November of 2015 Three Rivers must install a secondary slope lighting system for maintenance purposes. The secondary slope lighting system must direct all lights up-slope and must be circuited to allow multiple maintenance zones. After hours and except for emergencies, general slope lighting must be extinguished and lights for maintenance purposes may only be used when maintenance is underway in a particular maintenance zone

HSSA Lighting Operations Plan

TRPD analysis to meet condition #21:

- Add motorized shields to existing fixtures to direct light up the hill is not practical and results are not guaranteed as no standard package exists and custom product development would be costly (over \$250K)
- Install a secondary lighting system entirely directed up the hill results in a 99.5% reduction in light levels at the property line (about \$250K)
 - A totally redundant system
 - Maintenance costs are doubled
 - High capital cost
- Install a secondary slope lighting system comprised of existing fixtures, new LED fixtures, and re-circuiting results in a 98% reduction in light levels at the property line (about \$50K - \$75K)



HSSA Lighting Operations Plan

TRPD recommendation:

A secondary slope lighting system comprised of existing fixtures, new LED fixtures, and re-circuiting

- Meets the overall intent to reduce impacts of ski slope lighting on surrounding property owners
 - Light levels reduced by:
 - 98% during routine maintenance (nightly)
 - 65% during snow-making (season start-up, as-needed)
- Allows for multiple maintenance zones
- Highest cost-benefit solution
- Can be completed by November 2015



HSSA Lighting Operations Plan Normal Lighted Operating Hours



HSSA Lighting Operations Plan Snow Making Lighted Operating Hours



Sunset to Dawn - Average 150 hours
during season
Mostly prior to ski area opening
(weather dependant)

- Denotes new LED fixture with Shield
- Denotes existing light fixture

HSSA Lighting Operations Plan Terrain Park Lighted Grooming



Operating Hours
9PM to Dawn

- Denotes new LED fixture with Shield
- Denotes existing light fixture

HSSA Lighting Operations Plan



HSSA Lighting Operations Plan



During Ski Hours 2014/15 season



After Hours Grooming 2014/15 season

HSSA Lighting Operations Plan

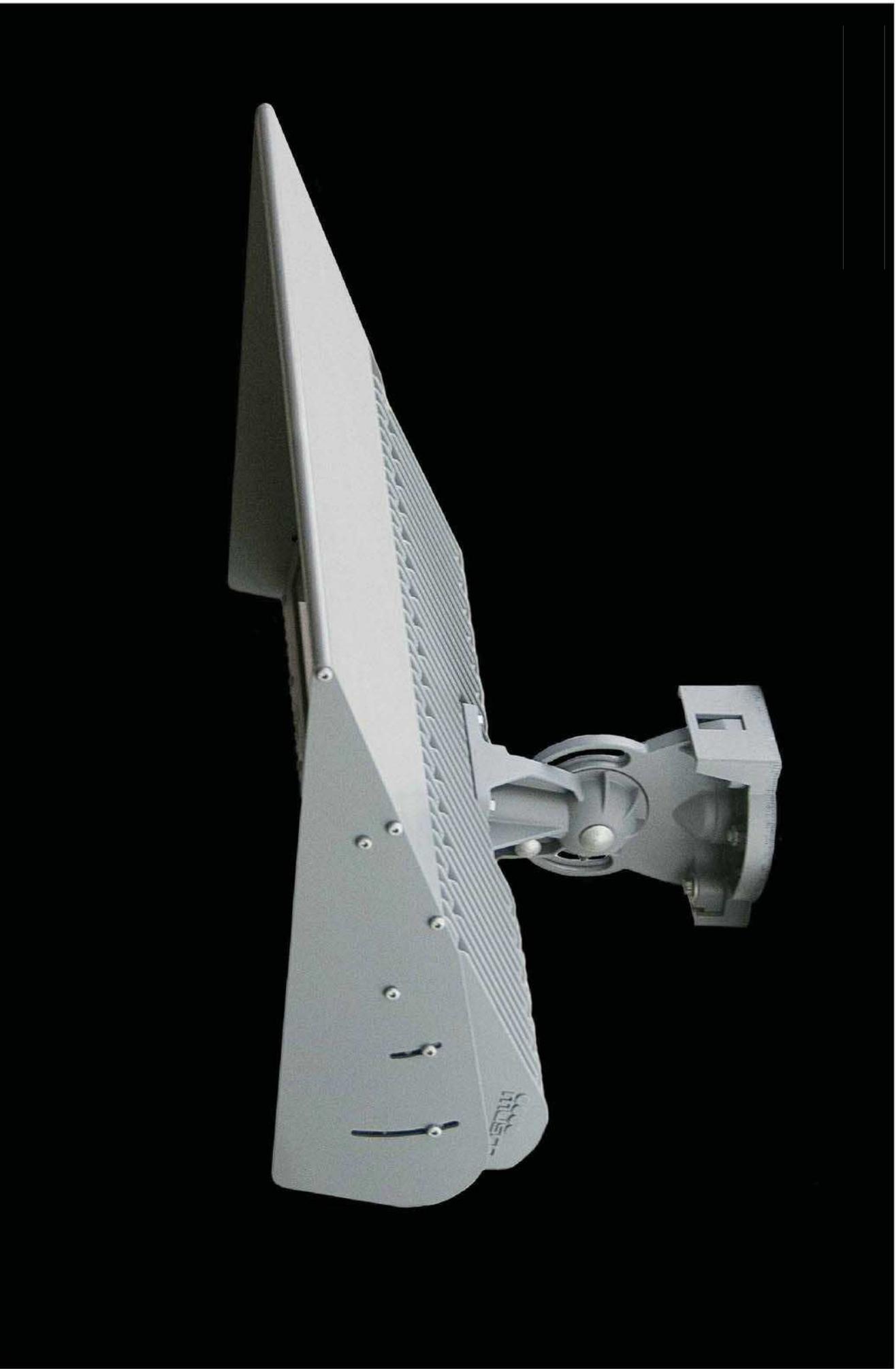


After Hours Grooming 2014/15 season
(Actual)



After Hours Grooming 2015/16 season
(Proposed)

Light·Structure Green™ – LED Luminaire



Evolution of Light Control

<p>1976 SportsCluster®</p> 	<p>1989 SportsCluster:2</p> 	<p>1989 SportsCluster:2 with Level 8™</p> 	<p>1989 Total Light Control™</p> 	<p>2005 Light-Structure Green™—HID</p> 	<p>2013 Light-Structure Green™—LED</p> 
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EQUIPMENT LIST FOR AREAS SHOWN

QTY	LOCATION	POLE	GRADE	ELEVATION	MOUNTING HEIGHT	Luminaires				
						TYPE	QTY	THIS OTHER	QTY	
1	P1	40'		956'	99'	LED 5700K - 65 CRI	2	2	0	
1	P2	40'		956'	99'	LED 5700K - 65 CRI	2	2	0	
1	P3	40'		974'	104'	LED 5700K - 65 CRI	3	3	0	
1	P4	40'		990'	109'	LED 5700K - 65 CRI	2	2	0	
1	P5	40'		905'	945'	LED 5700K - 65 CRI	2	2	0	
1	P6	40'		867'	907'	LED 5700K - 65 CRI	2	2	0	
1	P7	40'		857'	897'	LED 5700K - 65 CRI	2	2	0	
1	P8	40'		857'	897'	LED 5700K - 65 CRI	2	2	0	
TOTALS								17	17	0

Case 10917A-15



MY PROJECT
 Name: Hyland Hills Ski Area
 Location: Bloomington, MN

GRID SUMMARY
 Name: Home Candela Spill
 Spacing: 20.0'
 Height: Varies above grade

CONSTANT ILLUMINATION

SUMMARY		CANDELA (PER FIXTURE)	
Scan Average:	0.0000	Entire Grid	
Maximum:	0.00		
Minimum:	0.00		
No. of Points:	28		

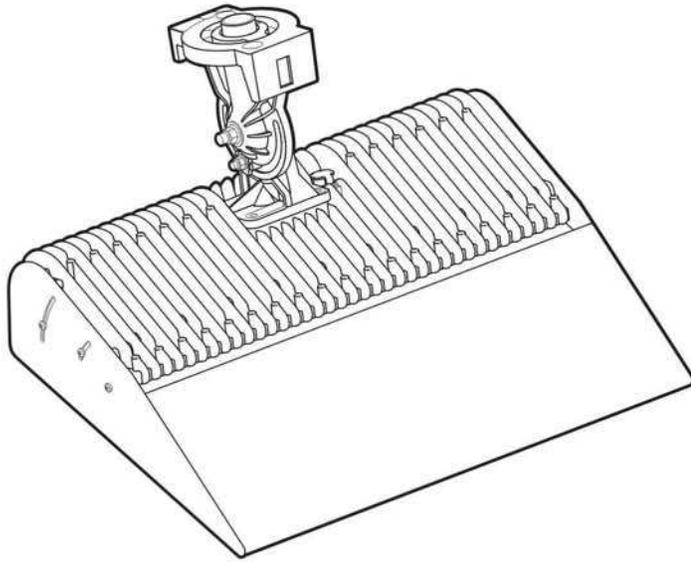
LUMINAIRE INFORMATION
 Luminaire Type: LED-96
 Design Usage Hours: 10,000 hours
 Design Lumens: 38,600
 Avg Lamp Tilt Factor: 1.000
 No. of Luminaires: 17
 Avg KW: 6.7 (6.7 max)

Guaranteed Performance: The CONSTANT ILLUMINATION described above is guaranteed for the design usage hours of the system.
Field Measurements: Illumination measured in accordance with IESNA LM-5-04 and CIBSE GLA. Individual values may vary. See the Warranty document for details.
Electrical System Requirements: Refer to Ampereage Draw Chart and/or the "Musco Control System Summary" for electrical sizing.
Installation Requirements: Results assume +/- 3% nominal voltage at line side of the ballast and structures located within 3 feet (1m) of design locations.

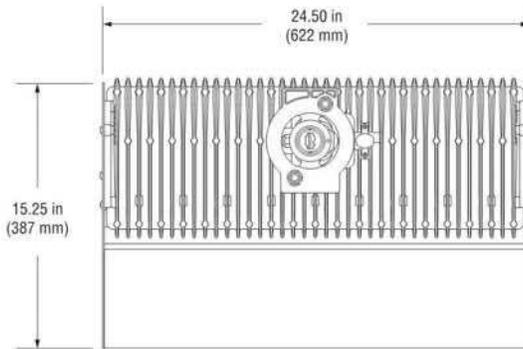
Pole location(s) ± dimensions are relative to 0.0 reference point(s) ⊗

ENGINEERED DESIGN
 By: Joel Stout
 File # / Date: 168706_LED-A-Scans 14-May-15
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ILLUMINATION SUMMARY

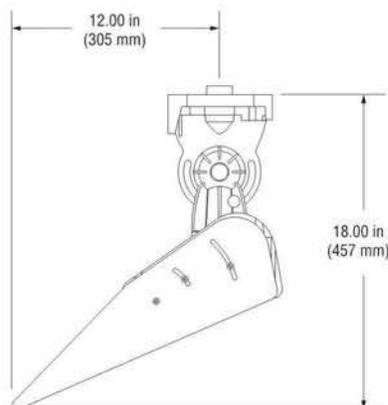


Top



Weight approximately 35 lb (16 kg)

Side



Luminaire Data

Photometric Characteristics

Useful life¹100,000 h
 CIE correlated color temperature5700 K
 Color Rendering Index (CRI)65

Finish

Die-cast aluminum, anodized, CASTGUARD™ coated, and powder-coat painted

Electrical Data

Operating Characteristics^{2,3}

	347 Vac 60 Hz	380 Vac 50 Hz	400 Vac 50 Hz	415 Vac 50 Hz	480 Vac 60 Hz
Max operating current²	1.14 A	1.04 A	0.99 A	0.95 A	0.82 A
Max power consumption²	394 W				
Avg power consumption³	355 W				

Driver starting (inrush) current 7 A

Operating temperature range -30 °C to 55 °C
 (-22 °F to 131 °F)

Driver fuse rating 10 A

Number of luminaires per driver 3

Driver efficiency 95%

Power factor 98%

Footnotes:

- 1) Useful life is the number of hours during which light output will not fall below target values.
- 2) Operating current and power values are per individual luminaire.
- 3) Luminaire power starts out at a reduced wattage and increases over useful life to offset lumen loss as light sources age.